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May, 1923

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Vol. 7 CHICAGO, ILL., MAY, 1923 No. 8

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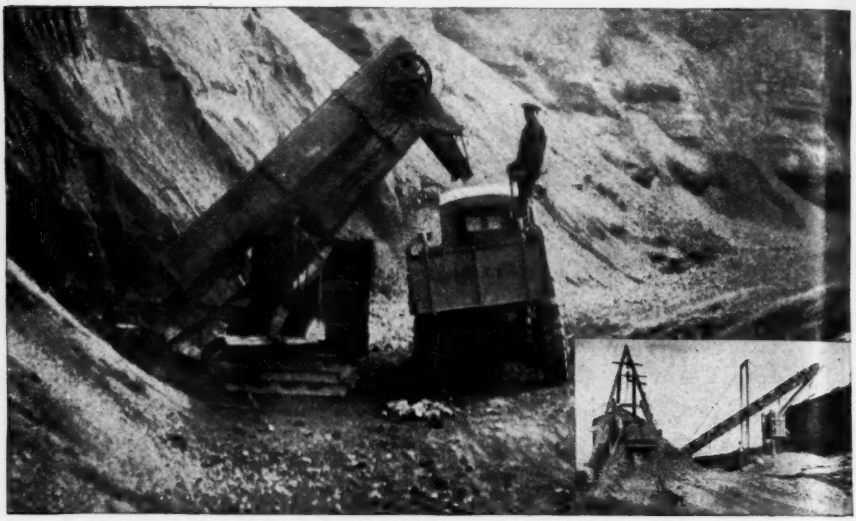

Barber-Greene Bucket Loader owned by B. D. Hyde, New York, and Barber-Greene Conveyor owned by R. C. Products Trust, Cleveland

Delivery Now as Important as Cost

Common labor is getting scarcer and dearer so rapidly that keeping up with deliveries will soon be quite as important as keeping down costs has been.

Because of the increasing realization of this fact many who put off buying Barber-Greene material handling equipment while its principal advantage was a reduction of handling cost are now buyjng it in order to make sure of maintaining output.

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The Moore Construction Company, of Nashville, Tennessee, reduccd its overhead charge per yard by 66%, and in addition saved 25 men in loading gravel direct from bank to trucks.

The Oakland Building Material Company, of Oakland, California, uses a Barber-Greene Bucket Loader to make the most of the eight-hour day. With it they made a record of handling 105 five-yard truck loads on December 15. Significant, too, is the fact that the one Barber-Greene replaced two loaders of another design and type.

The R. C. Products Trust, of Cleveland, uses a Barber-Greene Conveyor to replace a locomotive crane in loading beach sand, because the Barber-Greene reaches 30 feet farther than a crane and saves men and money.

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Pit and Quarry

Vol. 7 Chicago, Ill., May, 1923 No. 8

State Cement Plants

MOST of our state legislatures meet too often and stay in session too long. At least time seems to hang heavy for most of these legislators after the first few weeks; and then they seek to relieve the tedium and at the same time make a hit with the folks back home by introducing bills to build state cement plants.

South Dakota has been working on a proposition of this kind for a long time and has finally arrived at the point of taking bids just as this journal goes to press. These bids, however, were to cover only the office, stock house, concrete chimney and general foundations, as these are the only plans approved so far. These, if constructed and then abandoned because of lack of further approval and appropriation, would furnish a sorry monument to the state-owned idea. And such things do happen sometimes.

Governor Silzer of New Jersey has signed the bill authorizing the state highway commission to own and operate a cement plant. Regarding this the Engineering News-Record makes the following pertinent comment:

New Jersey has followed in the wake of several of her sister states to the west and has ordered the construction of a state cement plant. It remains to be seen whether she will follow the lead still further and neglect to build such a plant. Resentment against the high price and slow deliveries of cement is not confined to state highway departments, but it remains to be proved that these evils are the result of private ownership. The cement companies have put up a pretty fair argument in defense of prices, and one that can be answered only by the construction and operation of a state-owned plant. As to deliveries, that is something beyond the control of the manufacturer. Only actual operation can determine whether a state-owned plant means cheaper cement to the state. There is not the danger of political control that lies in the state ownership of utilities, but there are still the possibilities of false accounting, the loss of taxes and the necessity of production over and above the needs of the state. If the state is to sell cement to its citizens, why not underwear or coughdrops? However, if New Jersey wants to try the experiment there are several other states that will be glad to have her try. It may prove pretty costly to the Jerseyites.

In Missouri the senate struck from the big contingent appropriation bill an item of two million dollars with a ten-million-dollar revolving fund with which the commission could buy or obtain through condemnation, cement plants, gravel beds and materials used in road construction.

The right of condemnation was placed in the road law of 1921 so that the state, if necessary, could acquire cement plants, should prices become too high.

The revolving fund, provided by the legislature two years ago, was put in the original house appropriation bill. It was stricken out in the senate appropriation committee, and the conference committee sustained the senate. The explanation given by senators opposing the appropriation was that the money was not used under the last appropriation, and that there might be an abuse of power by the highway commission. Some contended that if funds were needed to obtain cheaper road materials, the money

might be taken from the general appropriation.

In Missouri and other states this kind of legislation is more or less openly admitted to be a club with which to beat down the price of cement from the commercial plants. This is more than likely the main purpose of the Wisconsin bill providing $30,000 for a legislative committee to investigate the feasibility of such a plant, and $40,000 for obtaining an option on a site. A. R. Hirst, state highway commissioner, is reported to be strongly favoring the proposal.

Oklahoma voted down the idea, regarding which the Oklahoman says editorially:

The house acted wisely when it rejected the bill providing an appropriation of $1,000,000 for the establishment of a cement plant to be owned and operated by the state. Such a plant would be a continuous burden for the taxpayers until abandoned, and then there would be a large loss on the investment. The privately operated cement plants are able to supply the needs of the state, while also furnishing cement for private consumption. There is no more reason why the state should make its own cement than the other highway supplies used by state institutions.

Ohio seems to be the last to come into this popular sport, and appears to want to authorize itself to produce almost any kind of road material. The bill as introduced authorizes the formation of a state road and building material commission, with authority to acquire by lease, condemnation or otherwise the property necessary. It is planned under the act, if passed by both houses and approved by the governor, to start a cement plant, or perhaps more than one, as well as sand and gravel plants in various parts of the state.

Of course in Illinois there is a recrudescence of this idea every little while, but it has lost its intimidating force, if it ever had any, and has also ceased to fool the taxpayers.

Minnesota seems fairly determined to defy the "trusts" at whatever cost. Here is the way the Minneapolis News voices its willingness to add to the cost of cement in order to vindicate the honor of the commonwealth:

If Minnesota can make cement for anywhere near what it costs to buy it, the state ought to take steps immediately for the establishment of a cement plant.

There may be lots of reasons for such a course of procedure and there may be some reasons against it, but the biggest factor in the whole thing is the cry that is raised again and again that the cement trust is back of the Minnesota road program.

It has been shown repeatedly that money paid for cement is a small part of the cost of road construction in Minnesota even where paving is put in. It has been shown that some pavements are put in without the use of a single barrel of cement. It has been shown that by far the larger percentage of the roads are to be graveled roads and not paved roads. It has been shown that a great many of the roads will be merely dirt roads well cared for and policed.

But every now and then somebody pops up and attacks the road program because of the cement trust.

It would probably cost more for Minnesota to make her own cement than to buy it. There might be a saving in freight.

But whatever the arguments for or against, a cement plant in Minnesota would serve to check an insidious propaganda that menaces the progress of our road construction and puts us under suspicion.

Cement Statistics

COMMENDATION is due all around for the way in which cement statistics were handled for 1922—to the Geological Survey, the Portland Cement Association, and to the individual manufacturers whose prompt returns made the compilations possible.

We are thus enabled month by month to have a fairly complete summary of the industry, with quarterly totals and comparisons. We also had a close preliminary report of last year early in January, and the report in April, much earlier than usual.

"Do You Know Why?"

AN advertiser in PIT AND QUARRY uses the above caption to call attention to his advertisement. The whole question is as follows: "Do you know why costs are higher in one crusher plant than in another?"

This caption will certainly serve the advertiser's purpose in calling attention to his "ad," and no doubt many will read who would have otherwise passed it by; but this question really opens up a chain of thought for every operator of a sand or gravel pit and a stone quarry. Not only is this question applicable to a crusher plant, but to every detail of plant that may be opened and also as to methods of operation, likewise to business policies. Many other questions started the same way could be asked, as, "Do you know why one man sells all his products and cannot fill all demands, while another cannot find sale for all he produces?" Such questions are self-searching, and to find the reasons why, and to answer such questions, will prove helpful to any operator.

First one must have experience, not only to ask these questions, but to find the answers. As to plant, a man must know what equipment is best suited to certain requirements and more especially to his needs. If he does not have this experience, he must obtain it from others, and fortunately for him, there are a large number of manufacturers who are able to advise him and give him the information that he lacks. It must be remembered, though, that the advice of a manufacturer is based somewhat upon what he has to sell. Selling his own product is his prime incentive to the advice he will give. If a manufacturer has crushers to sell that do not exceed a thousand tons daily output, he can not well advise a man who wishes to produce twenty-five hundred tons daily. However it must be said in justice to manufacturers that the vast majority will be honest to a customer and if unable to fill his requirements will be frank enough to so inform him.

But it is at this point that the business man will be wise to employ an expert who has no equipment to sell, to advise him. Such a man can only hope to be re-employed by advising his clients in the best manner possible.

To a great extent the same thing is true as to methods of operation. The operator should ask why and how others are getting better results than he is obtaining. This means that he must study how other people are carrying on their business. There is no better way of doing this than that suggested in the editorial on the opening page of PIT AND QUARRY in the April issue, where the editors of this journal advise operators to visit other plants and learn of new ideas and methods. It is by such visits that he will learn of improved machines and how to operate them, and especially will learn much regarding designs and lay-outs of plants. A man himself may have a well designed and the latest type of plant, yet may find another who is operating a similar plant to much better advantage. The "HOW" of any operation is better learned by seeing than by any other method. One of the greatest English writers of the age, Sir John Lubbock, aptly put it when he wrote, "I am a part of all I have seen."

As to why and how a man sells easier and conducts his business better, this can only be learned by studying what others have done and are doing. Today there are available a number of books on almost any business subject, besides a large number of trade and business magazines. Much can be learned by reading and studying these. It is not possible to make use of all one may read, but many new ideas and business methods can be assimilated and used that are gleaned from such publications,

More Carrying Capacity

IT IS a pleasure to note that the railroads are taking a view of greater responsibility in the matter of meeting the transportation needs of the country. This is evidenced in the recent special meetings in New York of the American Railway Association and the American Railway Executives, and in the results thereof.

These organizations have reviewed the situation in a careful manner; and with an estimate before them of the year's business, based on conservative data, showing unprecedented demands upon their resourcefulness of operation, they adopted the following as a definite policy and working program:

1. That by October 1, 1923, when the peak movement ordinarily begins, cars awaiting repairs be reduced to the normal basis of five per cent of the total equipment of the country.

2. That by October 1, 1923, locomotives awaiting heavy repairs be reduced to the normal basis for the entire country of fifteen per cent.

3. That to the extent coal is stored for railroad use, complete the storage requirements by September 1st, so that after that date the equipment and other transportation facilities may be used to the greatest extent for commercial coal necessities.

4. That the use of power and equipment for railroad construction and maintenance purposes be restricted to the minimum after September 1st in order that a maximum of power and equipment may be available for commercial purposes.

5. That railroads in producing and consuming sections impress upon all interested the necessity for movement of coal and ore via the Lakes in the largest possible quantity early in the season. That railroads serving upper Lake ports carry on campaign for early purchase and shipment of coal from the upper lake docks to points of consumption.

6. That an effort be also made to bring about the prosecution of road and building construction work as early in the season as possible in order that equipment may be available for larger movement of seasonal commodities.

7. That all interested be impressed with the necessity for loading all cars to maximum capacity in an effort to bring the average loading to thirty tons per car for the entire country; for unloading cars promptly; increasing storage facilities where necessary and practicable and providing adequate siding capacity to facilitate loading and unloading, thereby increasing the number of available cars.

8. That every possible means be adopted to increase the mileage per car per day to an average of thirty for the entire country, particular attention being given to prompt movement through terminals and yards and to the issuance of embargoes when necessary to prevent congestion.

Cooperation of shippers and the public in the past has been most helpful in bringing about heavier loading, prompt unloading and increased mileage per car, and only by their continued co-operation and their full knowledge of what this means to their own transportation requirements can results be secured in these matters. It will be understood that each individual railroad will co-operate with its own shippers to this end and the car service division will take similar action with national and district associations to bring about the fullest measure of co-operative effort.

9. In the event of a car shortage, reports to the Car Service Division should be carefully reviewed by each railroad organization so that the report will more nearly indicate the actual car shortage measured by the ability to load daily, rather than a cumulative shortage which does not reflect the daily existing condition.

10. The railroads have already established and have in active and effective operation a comprehensive organization in the Car Service Division for the central control and distribu-

Here's good news for you!

tion of freight cars which, during recent periods of car shortage, has under difficult conditions, secured to the public the best possible use of available freight equipment. The Car Service Division as a central agency, and through their District Managers, together with the District Shippers Committees, which have been and are being organized, will keep informed of traffic requirements with a view to the equitable and timely distribution and handling of equipment.

The railroads pledge themselves to renewed and effective compliance and co-operation with the directions of the Car Service Division, asserting the belief that, with the new equipment on order and the program for rapid conditioning of equipment requiring repairs, the freight equipment of the railroad will be handled and used in moving the commerce of the country to the best possible advantage.

The co-operation of the public with the railroads and their officers and employes generally is invited in order that by a better understanding and united effort transportation may be facilitated and the needs of the country more promptly and adequately provided for.

It was also resolved that individual roads give to the general public and to the patrons of their respective lines, information as to their program and also keep them currently advised of the progress made hereunder, including, so far as the individual line is concerned, information as to the progress made in its locomotive and car repairs and other improvements in transportation facilities.

Encouraging was the report presented showing that individual railroads in the fourteen months from January 1st, 1922, to March 15th, 1923, have purchased an aggregate of 223,616 new freight cars, of which 117,280 have been delivered and put in service, and on March 15th, 106,336 were on contract for delivery during 1923; and in the same period, have also placed in service or purchased an aggregate of 4,219 new locomotives, of which 2,106 have been placed in service, and on March 15th, 2,113 were on contract for delivery during 1923.

The railroads are getting busy!

The numbers given, both as to new cars and new locomotives, are exclusive of subsequent orders which it is anticipated will be placed during the current year.

"The significance and importance of these figures will be appreciated," says the report, "when it is remembered that the average number of new cars and new locomotives added over a period of ten years, 1913 to 1922 inclusive, has been 101,009 new cars per year and 1,960 new locomotives per year, and that during the two years and two months of Federal control there were purchased a total of 100,000 new cars or approximately 46,000 per year, and 1,930 new locomotives, or approximately 890 per year."

Tests Weathering of Limestone

A series of tests to determine the resistance of limestone to frost action is now under way at the Bureau of Standards.

Small samples cut from the stone are soaked in water and are then frozen. After freezing they are put back in the water to thaw.

Of the samples tested many showed serious disintegration after they had been frozen seventy-five times. Others have now been frozen as many as eight hundred times and show as yet no serious disintegration. The samples come from different localities; and when the tests are completed the data will be of value to architects in the selection of building stone.

Rules for Blasting

By DANIEL J. HAUER

THERE have appeared in recent issues of PIT AND QUARRY several articles under the above capition or bearing on this subject that anyone interested might read before beginning thi sarticle, for nothing like the notes herein given have ever appeared in print, and as they have been useful to others they may prove the same to the quarry readers of this journal.

One of these articles appeared on page 61-67 in the August, 1922 issue. In this article there was one mistake made on page 64. The cut numbered Fig. 3, should have been Fig. 4, while the one numbered Fig. 4, should have been Fig. 3.

The second article appeared in the September issue on page 88-90, being entitled "Some Notes on Blasting." In the November issue on page 76 and 77 there was an article on big blast hole drilling, while another article bearing on the subject of blasting appeared in the September issue entitled "Methods of Breaking Boulders."

This last article covers some details of secondary blasting, while the article in the November issue discussed some features of primary blasting.

The other article appearing in the September issue discussed these two subjects, primary and secondary blasting, at some length, and although appearing after the article in the August issue, yet leads up to the general article on "Rules for Blasting."

This last named article is the basis for this article and some future ones on this subject. In it was shown the need for a rule or formula. The effective force of explosives was illustrated and the need of springing holes when certain types of drills are used, and a rule was laid down for deciding upon the charges for making springs.

Weights of stone were given and a factor for converting cubic yards into tons or vice versa. A discussion of how much rock various kinds of powder should loosen was likewise given, and it was stated that the writer used a dense sandstone as a standard or basis for all blasting.

With this as a basis and using the table given on page 89 of the September issue and likewise those on page 64 of the August issue, it is possible to obtain a factor converting the yardage moved by a blast from the standard of sandstone to any other kind of rock given in the list. The entire basis is cubic yards of dense or hard sandstone being loosened by one pound of 40 per cent strength dynamite. This is an average rather than a minimum or a maximum amount.

A word as to the minimum of rock loosened by a blast. If shallow holes are shot it is not always possible to loosen this amount, especially if the holes are less than 10 feet, but if the holes are 20 to 30 feet then the minimum should be obtained. With the modern deep hole drillers 30 foot holes can be classed as shallow drilling. With holes from 30 to 50 feet the average yardage should be obtained, while with holes of greater depth, the maximum yardage should be loosened. These facts cover open cut, side hill and quarry blasting.

The factors are as follows:

Soft or friable sandstone	1.16
Dense or hard sandstone	1.00
Dolomites	1.16
Limestones (soft)	1.16
Limestones (hard)	1.00
Serpentine rocks	1.00
Schists	1.08
Gneiss	1.00
Trap rock	0.90
Granite	0.84

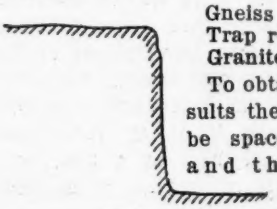


FIG 1

To obtain these results the holes must be spaced properly and the proper charge given.

The spacing of holes must be considered from two standpoints. First the distance the hole is placed back from the breast of the ledge. The face of the ledge must be approximately perpendicular. If it is not then

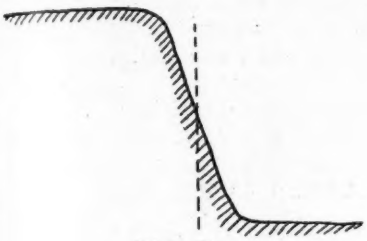


FIG. 2

it should be made so whenever possible.

Figs. 1, 2 and 3 show three cross sections of breasts of rock. In Fig. 1, the top of the breast can be used for measuring, but in Fig. 2, the midway point as shown by dotted line should be used. In Fig. 3, a breast is shown that should not be shot until the toe is worked out as indicated by the dotted line. To shoot it in the condition shown means inefficient blasting and the liklihood that part of the breast will remain in place as indicated by the line drawn across the toe. After the toe is worked out then measurement may be made from the top or middle as explained for the other illustrations.

The next thing in spacing is the distance between the holes. Consequently if blasting is to be done along scientific and the most efficient lines, the first formula or rule must be for spacing holes. This spacing must be either for large bore holes, that admit of the charge being placed in the bottom, or else well sprung holes, for it is obvious that the explosive will do less work if it is distributed throughout the bore of a long hole than when it is confined to a small area as it would be in a well sprung hole, where the explosives are placed directly under the bed of rock. This is due to the fact that as previously explained an explosion is a series of wave motions and thus acts in a concentric manner. Likewise when a blast is detonated or ignited there is a series of instantaneous explosions, and these take place quicker and one helps the other much more effectively when in a solid mass as in a large bore or sprung hole.

This is shown in Figs. 4 and 5 where a large bore hole has been sprung and the charge is confined to a few feet in the bottom of the hole and the detonator is placed approximately at the center of the mass of powder, while in Fig. 5, the same charge is shown in an unsprung large bore drill hole, taking up twice the length of the hole and the detonator likely to be placed away from the center of the charge.

It is easy to see that if a comparatively small charge is to be used to make a heavy blast then even this size bore of hole should be sprung in the interest of economy and efficiency.

The sketches given in Figs. 6 and 7 show the general method of laying out holes and loading them for quarrying rock for crushing purposes, for small building stone and one and two man stone for rip rap and similar

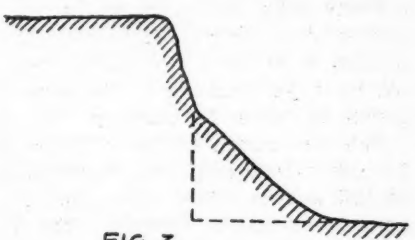


FIG. 3.

wet or dry masonry. Also for a combination of these products and large rough building stone and rip rap being quarried in connection with a crushed stone proposition.

In Fig. 6 is shown the top view of

a quarry stone ledge, and Fig. 7 is the cross section of the ledge. For economical use of explosives two or more holes should be shot at one time, so that there should be a series of holes and charges exploded. This fact should be self evident as with two or more disruptive forces being simultaneously concentrated on the same mass each working in a concentric manner, a greater portion of the mass should be torn asunder and it should be broken up finer. Thus the basis of the rule to be given takes into consideration these factors, and also that of stemming. Too many quarrymen in using dynamite do not stem their holes, as they did previously when black powder was in common use. This is due to several erroneous impressions, one being that dynamite shoots down, therefore the hole can remain open; and a second that if dynamite exerts the same pressure in all directions, leaving out the stemming material is of no importance. Both of these conclusions are wrong even if partially based upon facts, for as previously stated any explosive does most of its work in blasting in the direction of least resistance, and with an unstemmed drill hole much of the force of the powder can go out of the hole just as it does through the barrel of a gun. With the large diameter drill hole now in such common use, more of the force of the blast is lost than in former years when hand drilling and tripod drills were in common use. Thus all holes should be stemmed.

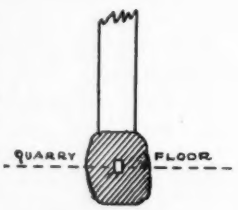


FIG 4

The number of holes to be blasted at one time must be decided from the size or extent of the operation and the method of handling the blasted rock.

It is obvious that if only a few hundred cubic yards of stone are produced a day, a blast of a few thousand cubic yards of rock is as large for this quarry as is one of 20,000 cubic yards for a quarry that is putting out 1,500 cubic yards in a day.

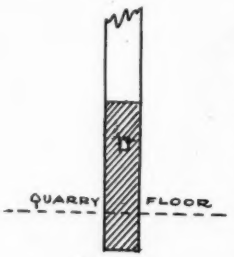


FIG. 5.

Generally speaking the larger the blast the more efficient it should be, yet it is not the part of good business to throw down such a large quantity of rock that the interest on the cost of drilling and blasting would be a serious overhead charge. For instance the writer remembers one case where it was stated that enough rock was thrown down in a quarry to give it blasted material to last two and a half years. If the drilling and blasting in this case cost $20,000, then the interest lost on this amount at 6 per cent per annum equalled 15 per cent or almost $3,000 which would be excessive as compared to an $8,000 blast, which would have covered a year's operation and given an interest charge of $480.

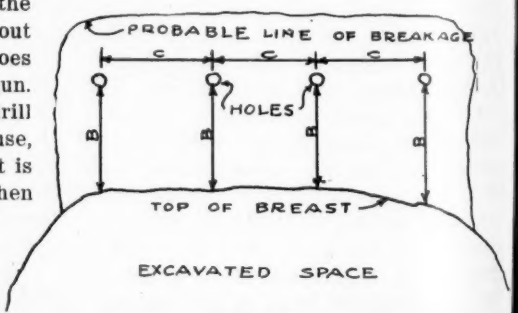


FIG 6

The spacing of holes here given is for sandstone and can be illustrated by the sketch in Fig. 6. The height of the breat is denoted by *A*. The distance from the breast to the proposed hole is B while the space between the holes is C.

The height of the breast being known the rest can be found by the following rule, which is based upon dense sandstone.

Rule 2. The distance B should equal two-thirds of A, while C should be 75 per cent of B or approximately one-half of A. Thus B = ⅔A, and C = ¾B or ½A.

This gives a rule for spacing all holes in any kind of rock; for by referring to the table of factors for different kinds of rock and multiplying the results obtained by this rule, the spacing for the specific rock being worked can be obtained.

Thus if a breast is 66 feet high then B will be 44 feet and C 33 feet in dense sandstone. For soft sandstone B would be 51 feet and C about 38 feet, while for hard granite the factor 0.84 would be used making B 37 feet and C 27 feet.

The next rule is based upon this one and is to obtain the amount of powder needed. It can be seen that if the breast is 66 feet high, the holes spaced back 44 feet from the breast and that ten holes are to be used spaced 33 feet apart that there is a block of stone 66x44x330 feet to be moved in front of the row of holes. Although with ten holes there are only nine spaces, yet it is known that in each end the rock should be broken beyond the holes about half the distance C.

Therefore the cubic yards to be moved would be 66x44x330 = 958,320 cubic feet = 35,493 cubic yards.

The next step is to refer to the table on page 89 of the September issue of PIT AND QUARRY and by dividing the average of the yardage moved by one pound of 40 per cent dynamite into the total number of cubic yards, you have the amount of explosive to use for the blast. For sandstone this average is three cubic yards so that it would take 3 into 35,493 equals 11,831 pounds of explosives and with ten holes an average for each hole of 1,183 pounds.

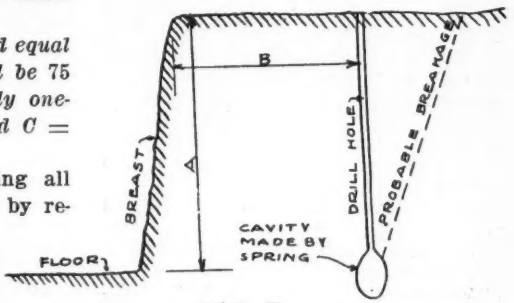


FIG. 7.

With a probable breakage beyond the holes of a fifth to a fourth of the yardage in front of the holes, this varying with the depth of the holes, this charge would give you a breakage of from 3 to 3½ cubic yards to the pound of explosive.

In another article we will see how these same rules work out with other kinds of rock, and consider other features that make these rules workable.

Explosives Sold

The quantity of explosives sold in the United States during the calendar year 1922 was greater by more than 16 per cent than the amount sold in 1921, according to the Department of the Interior. Reports received by the Bureau of Mines show that the total sales amounted to 431,772,077 pounds as compared with 372,107,503 pounds the year before. Of the total amount sold 178,866,225 pounds was black blasting powder, 209,476,084 pounds high explosives other than permissible explosives, and 43,429,768 pounds permissible explosives.

George Olds, of Rochester, Ind., is planning to open a large gravel pit in that section.

Tidewater Sand and Gravel Operation

The Old Dominion Sand and Gravel Company of Richmond, Va., operates at Petersburg, Va., a plant which employs some unusual operating methods, and has a number of features which should be of interest to all sand and gravel producers.

The Old Dominion Sand and Gravel Company is one of the interests of the Warner Moore Company, well known lime producers. The plant is in charge of Mr. Herbert Wingfield, general manager, and Mr. Rogers, superintendent. Under the direction of these two gentlemen the plant is operating successfully and profitably, turning out seven products which include a building sand, a ¼ inch concrete sand, a roofing gravel, a ¾ inch gravel, a 1½ inch gravel, a 2½ inch gravel, and a road gravel of plus ¼ inch minus 2½ inch size.

The deposit, located as it is in Tidewater Virginia, is not always so far as working conditions are concerned, a fixed quantity. The water in the deposit is influenced by the action of the tides, and the rise and fall of the stream along which it is located. Along with certain advantages this condition includes certain other disadvantages.

The material secured from the deposit is strong and hard, containing high proportions of flint and quartz—in fact, the deposit is well known for the amounts of material of silicious origin that it contains.

The overburden on the deposit is light, but must be carefully removed, for it contains a great deal of the trashy material often found in swampy ground. Under this overburden marketable material runs down to a very considerable depth, and assures the plant of a large supply of good sand and gravel.

Materials are excavated by a Bucyrus dragline, equipped with a Page scraper bucket and mounted on a platform which is moved from place to place by wooden rollers, as shown in one of the accompanying photographs. This machine is steam driven.

Sand and gravel excavated by the dragline is loaded direct into railroad cars of 80,000 pounds capacity, and hauled to the plant. These cars were made at the plant, under the supervision of Mr. Wingfield, by mounting special bodies on standard railroad trucks. At first, trucks of 60,000 pounds capacity were used, but it was later found advisable to increase to the size now in use. The plan of using these large cars appears to be eminently successful. With the haulage equipment that the company has these large dump cars seems to fit very smoothly into the task of conveying materials from the dragline to the plant. Their large capacity keeps the dragline working more steadily and imposes less work on the locomotive, and keeps a steadier supply of material running into the plant.

The cars are dumped very simply by the operating of levers at the side, which drop the bottoms and allow the sand and gravel to fall to a grizzly between the rails. Underneath this grizzly is a car hopper, a storage space of capacity sufficient to keep the plant going for a time, should the dump cars run a little bit off regular schedule.

A chute at the bottom of this hopper leads to a chain bucket elevator, 40 feet between centers, discharging at a scalping screen which serves the purpose of separating material intended for crushing from that which goes directly ahead to the plant. Sand and gravel passed by this scalping screen and intended for the regular course through the plant go first into what is known as the main hopper, an ample storage compartment, which serves to make for a flexible and steady operation.

Material that is rejected by the scalping screens drops to a No. 5 Champion crusher, and from this machine to the end of a chute from the main hopper that feeds an elevator leading to the screening plant proper. A No. 8½ Acme Crusher, used for secondary crushing, spouts into the end of the chute of the main hopper.

It will be seen from this description and from the accompanying sketch that this plant is divided more pronouncedly in two departments than most plants. The only connection between the crushing department and the washing and screening departments is the elevator carrying from the former and the chute carrying back rejections for recrushing.

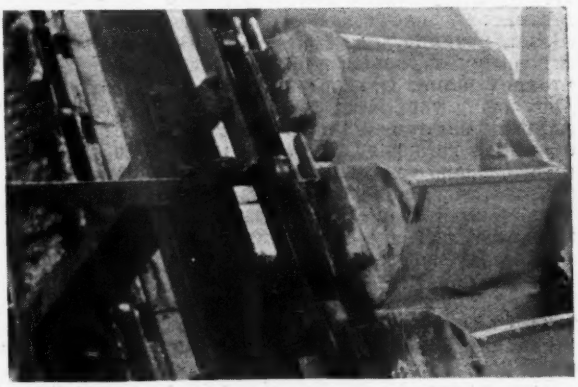
The crushing department, the first unit, is built very compactly. A large amount of space in this structure is taken up by the main hopper which

feeds the elevator to the screening and washing plant. Directly over the hopper is a rotary scalping screen, the higher end of which leads through a short chute to the head of the first elevator. Bins are located below the low end of the scalper to which loading chutes are secured.

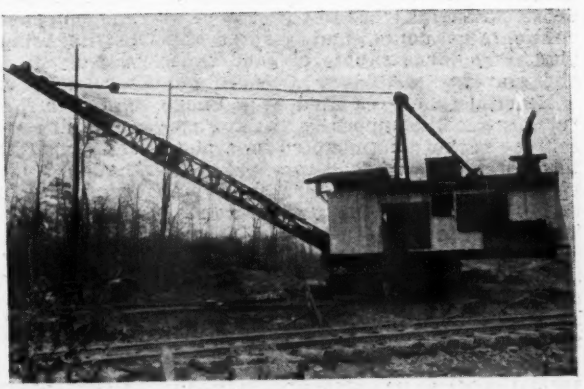
The washing and screening plant is fed by a chain bucket elevator, 80 feet between centers, running from a point below the chute out of the main hopper, up to the sizing screen at the top of the washing and screening department. In connection with the installation of this elevator there are two interesting features, neither of which may strike many producers as particularly new, but both of which would appeal to all producers as sensible provisions and, in the case of one of these features, as a practical guarantee against serious damage to the elevator.

The first of these features, shown in one of the accompanying photographs, is that of attaching flanges to the sides of the buckets used in the elevator and by these flanges mounting the buckets on the links of the chain. This method of mounting buckets has been the means of considerably reducing the wear on the bearings, the rail and the buckets. The reasons why the removal of the links to a distance from the bucket will result in cutting down wear should be apparent to any producer

Showing the Character of This Tidewater Gravel Deposit



Note Way in Which Buckets are Offset From Links of Chain



Bucyrus Dragline Used for Excavation of Material

who is operating a chain bucket elevator for carrying such abrasive materials as sand and gravel and crushed stone.

The second feature of the elevator is seen in the driving pulley at the top. This driving pulley is powered by a rope drive from the main counter-shaft at about ground level, connecting with the power house located to one side of the crushing plant. Power is transmitted from the rope driven pulley to the head of the elevator by a chain which, while well capable of standing the strains to which is would ordinarily be subjected, is still weaker than any part of the elevator itself and would naturally be the first thing to break in case the elevator should "hang." A number of costly breakdowns at the Old Dominion plant has taught this lesson. On one occasion, when the elevator "hung," a high-priced and difficultly installed sprocket was broken before the power could be shut off. Now, should an accident happen, there need be no worrying about this sprocket. The chain before mentioned is certain to give out first, saving the sprocket and the rest of the elevator from serious damage. The idea will not be new to many producers, but it will be to some others, and should be acceptable to all.

This large elevator running from the crushing to the screening and washing plants, discharges at the rotary screen equipped with a sand jacket and means of conveying the sand to a Dull sand tank. One product of this screen is ¾ inch gravel, which is dropped by a chute directly to loading bins. Rejections from this screen are dropped by chute to a reject screen that is equipped interchangeably with 1½ and 2½ inch perforations. The product of this screen also goes direct to bins and its rejections through the reject chute to the No. 8½ Acme crusher which serves as a recrushing machine and spouts the material as described, into the end of the spout of the main hopper leading to the main elevator.

The matter of careful sand washing is given pretty close attention at this plant and, as a result of the effort expended, a good supply of clean material is available. Over and above the sand for which there is a steady demand, quite an amount goes into a stock pile shown in one of the photographs at the back of the plant. The proportion of sand to gravel at this plant runs pretty high and thus large stock piles of sand soon accumulate.

Material is all loaded on cars from overhead through bottom bin gates. On one of the loading tracks there is at the side a chute for running into cars a mixture of ¾ inch and 2½ inch gravel, a popular seller. As shown in the photographs and sketch there are two loading tracks, and a loaded car track at the lower level running between the crushing plant and the screening and washing plant. Cars are dropped in the proper positions on the loading track by gravity and are then sent up the tail track to a switch back through which they are passed to the loaded car track, all by gravity.

Power is furnished to the plant through rope drives running from the main counter shaft referred to above, which leads out of the engine room from the power house at the side of the crushing plant.

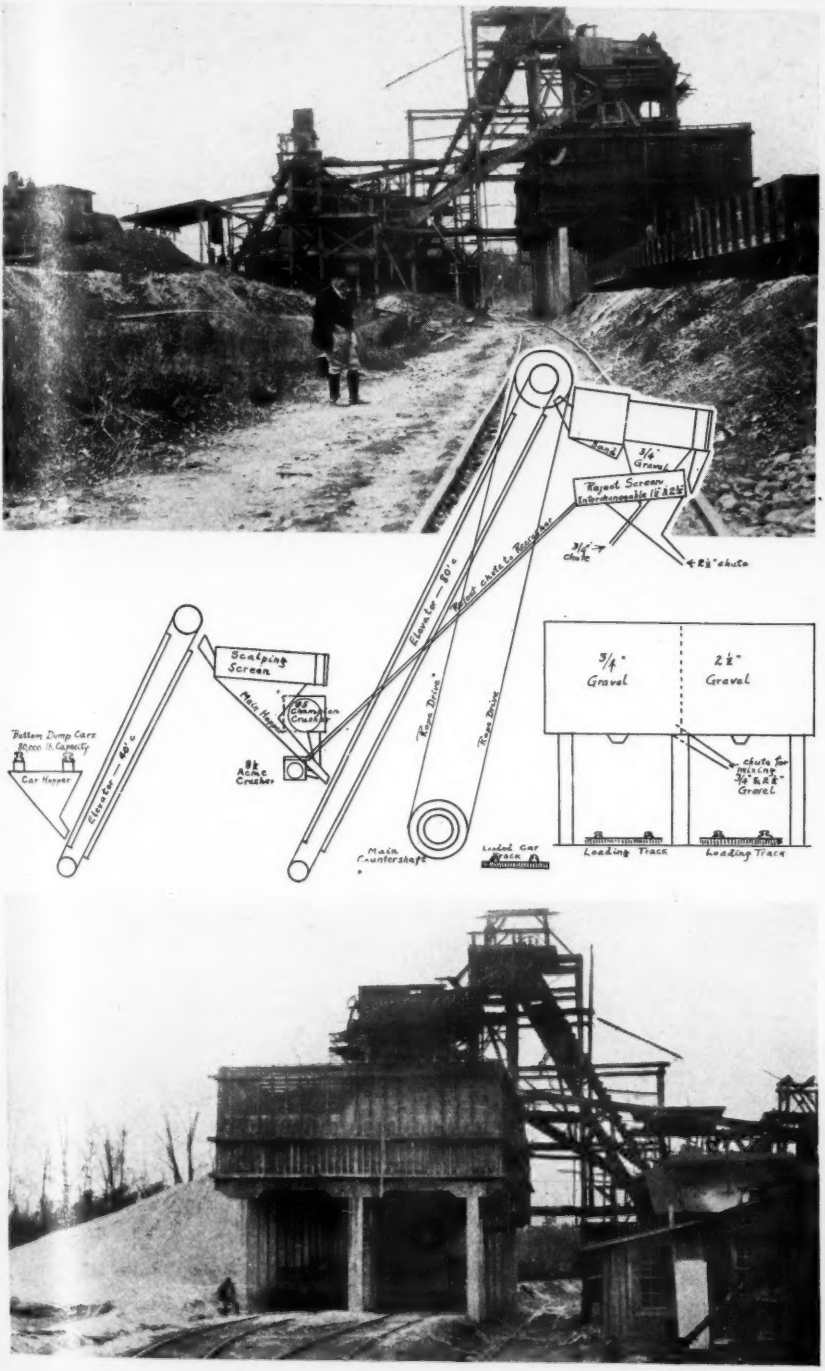
Construction at the Old Dominion Sand and Gravel Company's plant was done along solid, substantial lines. The washing and screening plant is supported by concrete pillars which, aside from compactness, impart great strength. It was necessary in the construction of this washing and screening plant, as well as of the crushing plant, to erect good foundations. This has been done in all cases and the structures are very substantial.

Adjoining the power house is a well-equipped machine shop in which much of the repair work of the plant is done and certain iron shapes, etc., which can be made more cheaply than purchased, are turned out.

Under the guidance of Mr. Wingfield and Mr. Rogers the plant is operating very successfully and profitably. Mr. Rogers is a man of more than average mechanical ability whose experience falls in well with that of Mr. Wingfield, a trained engineer.

The Pleasant Lake Gravel Co., Lima, Ohio, has recently been incorporated with a capital of $60,000. The incorporators are Cliff M. Wood, Fred L. Hammer, Dan R. Tripplehorn, Nella L. Wood and Homer N. Wood.

The Turner Sand & Gravel Co., San Antonio, Texas, has increased its capital stock from $50,000 to $150,000.



Sketch and Views of Plant of Old Dominion Sand and Gravel Co.

The Kaiser Paving Co., of Oakland, California has the contract for 18 miles of concrete paving connecting the Valley Boulevard with the Coast Line, at a cost of $530,000.

Material for this job will be hauled 27 miles, a round trip of 54 miles—and the hauling is being done by three PLYMOUTH 7-ton 4-speed [illegible] grade of 1½ per cent, but the PLYMOUTH takes them up this grade seemingly without effort.

The Kaiser Paving Co.'s Statement

The Kaiser Paving Co., states that [illegible] per trip. Locomotives are doing everything and more than was expected of them.

round trip of 54 miles—and the hauling is being done by three PLYMOUTH 3-ton 4-speed

grade of 1½ per cent, but the PLYMOUTH takes them up this grade seemingly without effort.

Ask us for Bulletin fully illustrating and describing this superpowered Locomotive.

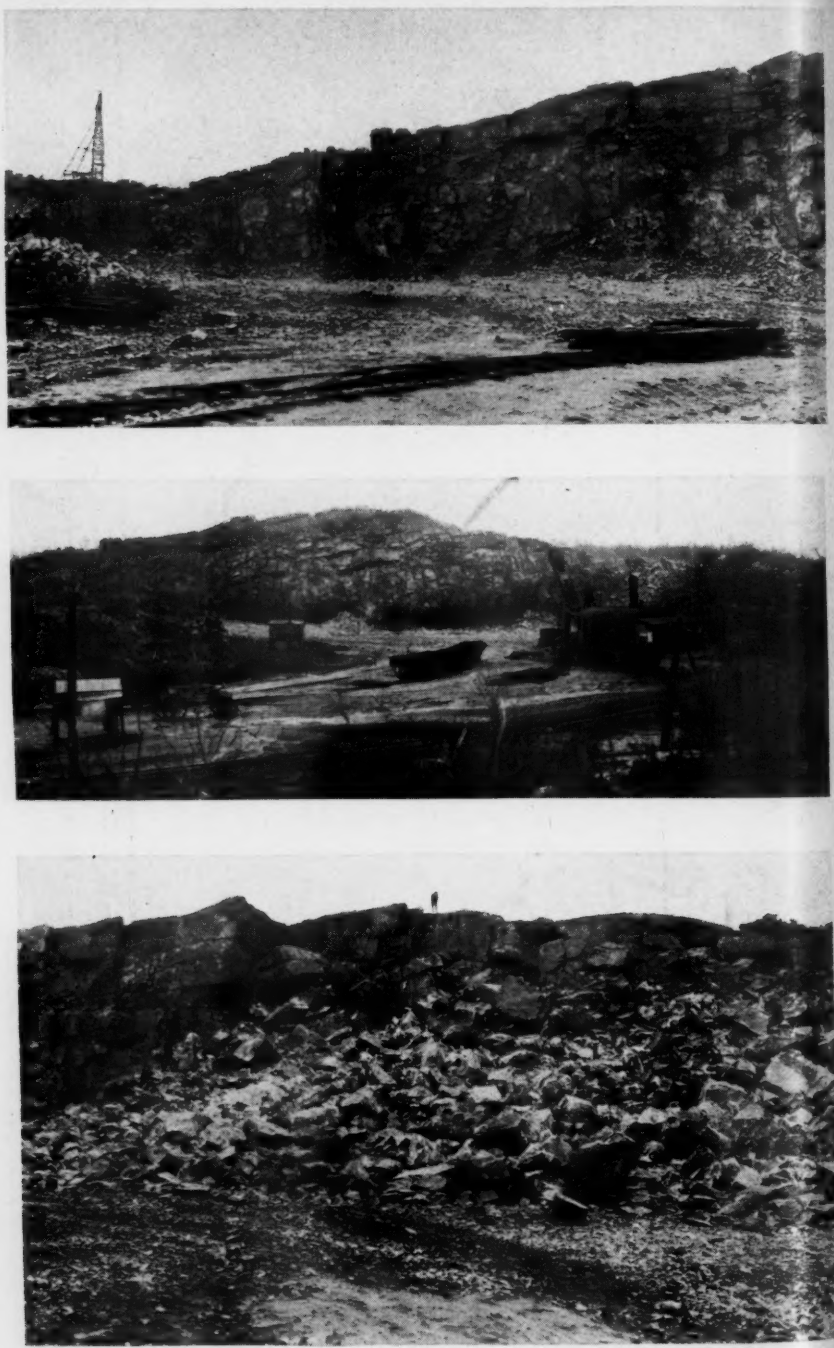
The Kaiser Paving Co., states that

per trip. Locomotives are doing everything and more than was expected of them.

The Fate-Root-Heath Company, Plymouth, Ohio

PLYMOUTH

Gasoline Locomotives



Before, during and after a blast at New Ulm, Minn.

Blasting at New Ulm

Stone for Spring Work Shot Down in One Big Blast

On the opposite page are shown three illustrations taken a short time ago at the quarry of the New Ulm Stone Company, New Ulm, Minn.

The top picture shows the quarry just before a blast was touched off. The face is 60 feet high and 1,000 feet long. On the top is the Armstrong No. 25 special drill with which the holes were drilled, these being spaced 20 feet apart and loaded with 60 per cent Hercules dynamite.

The second illustration shows the initial stage of the blast, the whole face of the quarry seeming to rise upward and outward.

Below is a photograph of the quarry after the blast, with the stone ready to be placed in cars by the steam shovel and hauled to the crusher with a Plymouth locomotive.

About 25,000 tons of material was torn out by this blast, using 3,550 pounds of dynamite.

The material is quartzite, and reported by the Bureau of Public Roads to be the hardest tested up to the date of the test.

International Cement Returns

The International Cement Corporation reports net income of $1,420,371 for the twelve months ended December 31, 1922, equivalent after preferred dividends, to $4.04 a share on the common stock, as compared with $1,457,880, or $4.30 a share in 1921.

For the quarter ended December 31, 1922, net income amounted to $457,079 after charges and Federal taxes, equivalent after preferred dividends to $1.33 a share earned on 324,722 shares of no par value common against $432,929 or $1.25 a share in the preceding quarter and net income of $189,263 in the fourth quarter of 1921.

Total sales in fourth quarter of 1922 were $2,960,768 against $2,482,752 in 1921, and expenses, depreciation, etc., amounted to $2,460,026 against $2,191,572.

Evansville Is Active

Producers Along the River are Preparing for Busy Season

By Our Evansville, Ind., Correspondent

Sand and gravel fleets along the Ohio river, the Wabash river and White river are starting what they believe will be the busiest season in many years. Many of the plants have been enlarged to get ready for the season's business. By the first of May it is expected that operations will be in full swing at the plants at Evansville, Tell City, Rockport, Mt. Vernon, Grayville, Ill., Hazelton, Ind., and Shawneetown, Ill. There has been a great deal of building planned for the season and there also will be a large program of road building in southern Indiana, southern Illinois and western and northern Kentucky carried out during the summer and fall. The plants at Evansville are busy now and the owners expect to have about all the work they can handle for several months to come.

The building of the new bridge over White river at Hazelton, Ind., thirty miles north of Evansville, is taking a lot of sand and gravel and fleets along the White river plying between Hazelton and Petersburg are busy.

The Penglase Engineering Company at Grayville, Ill., organized about two years ago to handle sand and gravel along the Wabash river, is busy. Several fleets have taken out sand and gravel this spring for road construction work in both Indiana and Illinois. The company is owned by capitalists at Grayville and Evansville, S. B. Alnutt, a banker of this city, being one of the stockholders. The company's fleets have been operating recently on the Wabash river at both New Harmony and Crawleyville.

The Eastwood Sand and Gravel Company at Grayville, Ill., is erecting a new plant and the outlook for trade for the season for this company is good. The two new boats built by this company have been launched on the Wabash river and the two barges will be ready for launching about the middle of April, it is announced. The four boats have been built by a construction company at Ripley, Ohio.

The Art of Shoveling

By DANIEL J. HAUER

IN THE December issue of PIT and Quarry there appeared a short article on the use of shovels. This was meant as an introduction to a series of articles on the use of shovels and the art of shoveling. In this first article was pointed out the need of training men to shovel and that there are correct and incorrect motions to use, and that even if the men are properly trained they cannot do the most economical work unless they have the proper tools.

"A spade is a spade," is an old saying, yet as the modern shovel is the successor of the old time spade, there are many different kinds of spades and shovels. So today it is necessary to select shovels for the various kinds of work that must be done.

Shovels vary much as to sizes of blade and shapes, but all shovels today can best be divided into two general classes based entirely on the length of the handle.

The shovel in most common use in this country is the short handle shovel, generally called the D handle shovel, due to the fact that the hand grip on the handle is shaped like the capital letter D. The one in most common use in continental Europe is the straight long handle shovel. This kind of shovel is frequently referred to in America as the "lazy man's tool." This is based upon an erroneous assumption, for if a close study is made of the subject it will be found that a lazy man can kill more time with a short handle shovel than with a long, or to put it another way, the indifferent workman will do more work with a long handle shovel in spite of himself than he will perform with the D handle tool. This is due to the fact that the man performs less motions and does more work with less expenditure of energy.

Anyone can experiment with the two kinds of shovel and if careful and exact records are kept it will be found that the statements made here are correct. This will be shown in greater detail later in the article.

The only other variation in the handle is that known as the lift, a matter to which little attention is paid. except by the manufacturers, yet at times the lift is of importance, especially for very tall or very short men.

The rest of the differences in shovels are in the blade, not only in the size and shape. Sizes are made standard varying somewhat with the manufacturers, although the general sizes are nearly the same, yet they may be designated differently by the various manufacturers.

But the shape has much to do with the ease of shoveling and the quickness of picking up the load of material.

For earth mixed in the rock, or for rock broken into irregular size, as in a quarry, and also for heavy clays, a round pointed shovel with a decided curl or roll to the blade should be used. The pointed blade seems to be able to cut under the rock more easily, and the curl holds the load better except where the rocks are large, 6 inches or more in dimension. When there is much of this size of stone and little or no earth or fine stuff, a stone fork should be used.

Flat stone forks, with two outside tines raised above the rest, are better for handling stone, except to clean up a pile, than shovels. A three quarter length handle admits of easy handling, and the tines go into the pile or under it more easily than does the solid blade of a shovel.

For concrete and for crushed stone

shoveling a square pointed shovel with the edges of the shovel turned up, should be used for small sizes of crushed stone or run of the crusher, or for fine gravel, chert and similar materials. For the large sizes of stone, a flat, round pointed shovel with the sides slightly turned up should be used.

For sand, especially if moist, a flat wide shovel with the edges turned should be used. It is frequently possible to moisten sand for shoveling if it is not always wet. When this cannot be done and the sand is entirely free from loam and runs easily, then a small size scoop shovel should be used. However, as the scoop is likely to weigh more than the flat square pointed shovel, the latter should be used if it will carry an economical load.

Coal should be shoveled with a scoop; but as there are different grades of coal, such as buckwheat, rice, pea, lump coal, nut coal and run of mine, it is necessary to get different sized scoops in order to handle an economical load. The sizes of scoops will vary slightly in shape. It is, however, seldom that more than one or two different kinds of coal are used at the same time, so that it is not an expensive proposition to have the proper shovels. When the coal is being shoveled from a car or a bin, from on top, a breaking down scoop should be used in one corner until the bottom is reached, when the regular scoop shovel should be brought into play. A breaking down scoop has a long sharp point and is made round and not so flat as the ordinary scoop.

Very fine gravel should be handled with a scoop, but coarse large gravel should be handled with the same shaped shovel as it used for crushed stone.

Thus there are three factors in selecting a shovel: First is the length of the handle, second, the shape of the blade, and third, the size of the blade.

More than twenty-five years ago the writer made some experiments to determine the load that a shovel should carry, but he could not afford to have special shovels and blades made to test out all the deductions he was able to make from his experiments. These studies have continued through the years. The only other man the writer knows of who has conducted any extensive experiments and tests of shoveling was the late Frederick W. Taylor. From the writer's own tests he had concluded that an economical load for a shovel to carry was 20 pounds. Mr. Taylor's conclusions made him decide upon a 21 pound shovel for handling ore, earth, rock, coal and other materials. Inasmuch as this standard has been accepted by some, and shovels are being manufactured for the different materials to carry this load, the writer has adopted it as his economical load and now recommends it.

The general sizes of shovels manufactured and sold are known as Nos. 1, 2, 3, and 4. Nos. 1 and 4 are in little use, but Nos. 2 and 3 are used extensively. No. 2 is preferred in some sections of the country and No. 3 in other localities. Most manufacturers make these sizes of shovels, but a No. 2 of different manufacturers may vary a little in size.

These sizes run through the various types of shovels, such as square and round pointed, scoops and forks. Such sizes were not determined upon with a viewpoint of carrying a scientifically gauged load, but to carry a fair load and meet a popular demand. No. 1 is the smallest size of shovel made by most manufacturers, but a No. 0 is made by a few makers.

The 21 pound shovel is designed to carry an economical load and is based upon scientific principles. In speaking of a 21 pound shovel it must be

understood that a man does not obtain such a load every time he shovels, but it is an average load, varying at different times in the same man's hands up to 25 per cent, which means a difference of 4 or 5 pounds. Thus the load may go under 21 pounds and upon other occasions over that amount.

In order to obtain a shovel carrying an average load of 21 pounds in different materials, it is evident that the size of the bowl must vary with the class of material that is to be handled, and we must accordingly give up numbering the sizes of shovels and refer to them as sizes to handle different kinds of material, as an earth shovel, a rock shovel, a concrete shovel, a crushed stone shovel, a coal scoop, and so on. One manufacturer has adopted this method, and ultimately the others are likely to come to it, when shovel users learn what it means to them to use a shovel carrying an economical load.

The laborer using a shovel puts forth so much energy in an hour. Give him any shovel, even one half worn out, and so long as it does not bother him he will continue to work with it, even if the shape and size are wrong. He is working for his wages and cares little about the tool in his hand. Consequently change the tool. Make the handle of such length as to allow him to work with greater ease and more rapidity. Make the shape such as to hold the load without spilling part of it, and so the man can drive it into or under the material easier. Make the size such as to shovel a cubic yard in one hundred loads instead of one hundred and fifty, and it is evident that the man's work will not be made harder or even as difficult, yet the amount of material handled will be decidedly increased in spite of himself and in many cases without his knowledge. But one old shovel kept on the job with those of modern design may mean to lose out in effecting a change; for the men will cry out for the old shovel carrying the smaller load, thinking it will benefit them.

The points shown in this article embrace the main principles of scientific shoveling and the results obtained are almost beyond the comprehension of the man who has not studied the subject. In most cases a saving of about 10 per cent can be made by using a long handled instead of a short handled shovel. The saving effected by the proper shape and size is more difficult to calculate, for it depends upon the kind of material that each man is handling and the shape of the shovel he is using. The size of the shovel can effect a saving from 10 to 50 per cent. So it is easily possible to save on the entire operation about 25 per cent, a saving in almost any operation that should amount to a thousand dollars or more in a season. Put such an economical tool into a laborers' hands and offer him a bonus and the increased money he will earn for himself will be small as compared to the extra profits it will make for the owner.

In considering the proper load for a shovel, it must be borne in mind that the economical load decided upon is the average for the average man. Thus a man using a 21 pound shovel will move, in whatever class of material he is working, that number of pounds (average) at each shovel load.

If a man cannot handle such a load and keep up with his co-workers, then he is not suited for economic shoveling and should be placed at other work. This is a part of shovel management. A many may be a poor shoveler, but a good picker, or he may be suited for sledging or attending to a machine. It is seldom that a man is utterly worthless.

The blade of a No. 2 shovel is approximately 10 inches wide and 12

inches long. This is for a square pointed, plain black or polished shovel. A round pointed shovel is generally made about an inch longer and half an inch narrower. The two shovels if of the same size or number, will hold the same load in the same class of material. Some manufacturers differ from others in the dimensions of their shovels, but it will only be by the fraction of an inch.

In shoveling ordinary earth, it takes almost 150 shovelfuls to make up a cubic yard. The average load on such a shovel of this size is from 12 to 13 pounds. As the economic load is 21 pounds as has already been pointed out, it is evident that the No. 2 shovel load is but 60 per cent of this economic load. This means that a properly designed shovel for average earth will carry one and two-thirds times the load of a No. 2 shovel, consequently it will take but ninety shovels loads of the new type of shovel to make a cubic yard. Add a long handle to this and the amount of work done is increased. These are theoretical figures for the man who knows how to shovel and they cannot be obtained from every man, but it is an easy matter to increase the work of any shoveler if the art of shoveling is understood.

At a board meeting of the Southeastern Portland Cement Company, recently, W. Jordan Massee was elected president; Geo. P. Diekmann, vice-president; John T. Moore, chairman of the board of directors; J. E. Satterfield, secretary-treasurer and E. B. Weatherly, attorney. This company has acquired more than 600 acres of land near Ainslie, Ga., 30 miles south of Macon, and the plant which will be erected at Ainslie, will cost approximately $1,500,000 and will employ 500 men.

The Chazy Limestone Corp. has been incorporated in Plattsburgh, N. Y., with a capital of $300,000. The directors are: W. H. Williams, H. C. Jeffries and W. H. Higginbotham.

Cars for Pits and Quarries

IN THE December issue of PIT AND QUARRY the first of a series of articles appeared on this subject. This is a continuation. Those interested are referred to the previous article.

There are a large number of different types of cars used for hauling sand and gravel and blasted rock. The types are not distinct, as one kind may be used for several conditions. Thus there are side dumps and end dumps, and some of them are meant for hand loading while some of the same class may be used for machine loading.

In selecting cars the first consideration should be the method of loading. If cars are to be loaded by hand they should be of a low down type. For sand and gravel, when shovels are used, the car can be higher than for loading blasted rock, where most of the work is done by men's hands.

For loading blasted rock a car should never be more than 36 inches high, and a less height should be preferred. Thus it is possible to get cars of 2-ton capacity that are not over 2 feet in height, and this means quicker and easier work for hand loading. The writer has seen some cars of which the bottoms were only a few inches above the base of the wheels, and by not using end gates or doors, large rocks could readily be rolled into the cars. As far as loading was concerned these were ideal, but it was not possible to unload them under all circumstances.

As a rule, however, it is not always possible to use such low type of cars, and in most cases the loading must be done over the sides. Thus the height of the wheel and that of the sides govern the loading height.

One advantage of the V-shaped rocker car in hand loading is that it may be tilted down so as to make it lower for loading until it is more than half

full. Few cars possess this advantage. These cars are used both in pits and quarries for sand and gravel as well as rock. High, larger size ones are also used for machine loading.

As already stated, for hand loading of stone the maximum height of cars should not exceed 36 inches. For sand and gravel when hand shoveling is done the height of cars can be from 36 to 54 inches. To go over this height means to cut down the rate of loading. These things mean much in continual operation.

The cars to be loaded by machines should never be of the low type, and it makes little difference in most cases whether they are 5 feet or more or 10 feet high, for most machines in excavating or hoisting raise their loads to such heights, and to load low cars means time wasted in lowering the loads, after they have been elevated. Thus cars to be loaded by cableways, derricks, steam shovels, draglines, cranes and other devices, should be of fair height.

In loading cars by derricks, either skips or buckets are used to first load the stone, then it is dumped into cars. This is also done by cableways and cranes. A skip is preferable to a bucket, as the skip is low to load, while the bucket has high sides. Thus very large pieces of rock that cannot be lifted by several man can be rolled by means of a bar by one man into the open end of a skip. This means the saving of much expensive boulder breaking. Men can also throw or cast with a shovel into a skip at a much lower cost than into a bucket or car.

For successful and easy dumping of skips from a crane, derrick or cableway, the skip should first be landed upon a sloping platform and then dumped as shown in Fig. 1. This prevents spilling the stone upon the ground and also saves injury to the car by the skip, both important considerations.

The next feature to consider is the size of the cars. This depends upon the method of loading, the size of the plant and the space available for dumping the cars. Too many operators decide offhand on the sizes of their cars, with the result that they have a misfit plant, either with too much money tied up in cars or else the cars are either too small or too few to keep the plant at its utmost capacity.

It is manifestly wrong to have such a large car that when it is dumped its load is so scattered around the crusher mouth, or that of a screening or washing plant, that the greater part of the load has to be rehandled. This must generally be done by hand methods, so that it is both slow and expensive. The scattering of a carload of given size will depend upon the method of dumping. An end dump car, even of large capacity, shoots its load into a limited space, while a side dump car distributes its load along the entire length of the car, unless the car is built with pockets and each pocket can be so controlled as to dump separately. Thus if a side dump car is to be used and when dumping its load it must be confined to a space of 10 feet, then this sets the limit of the length of the car, and if one dimension is fixed by this and a second by the method of loading, the size of the car is decided.

With these factors decided, hand and machine loading must be considered. If men are loading cars it is well not to have too large capacity cars. A 1-ton or a 1-yard car is generally too small, for a plant is not likely to be kept at its maximum capacity with such a small car, unless they are made up into long trains, which is seldom practical. Too large a car means that the men become tired of working on a single car to load it. They lose interest in their work. It has been found for hand loading that a 2-ton car is ideal. If two men work together load-

ing a car, one of 2-ton capacity can be loaded in a reasonable time without tiring them.

If skips are used in loading cars then their capacity should range from 2 to 5 tons according to the capacity of the car, for a skip load should be the same as a car, as it is a poor economy to have a car waiting for another skip when it could be on its way to the plant.

For other methods of machine loading a large car should be used. A steam shovel will do more work loading large cars of the high type than it will loading smaller cars of low build. In this case the deciding factors must be those of dumping and keeping the load within the prescribed dumping area. A combination of a dumping skip on a long flat car will give a large bulk of a load, yet confine the dumping within a limited area.

The next feature of cars to be discussed is the method of dumping.

There are three distinct types of dump cars, end dumps, bottom dumps and side dumps. The end dumps are generally a low type of car and are either dumped by means of a tipple or else the car is run up a sharp incline so that when the gate is released the load slides out. Such cars are built to hold from 1 to 5 tons. Those meant to be dumped by a tipple are frequently named mine cars, as most coal mining cars are dumped by means of a tipple. This is a very successful method of dumping 2-ton cars as the cars are dumped clean and easily righted so that they are made ready for immediate loading.

The bottom dump cars are frequently called hopper cars as they are built in the shape of a hopper, the dumping doors being on the bottom of the hopper. For this type of car the track must be directly over the receptacle that is to receive the material, as a bin, a crusher, a screen or washer, and as this is not always practical, this type of car is not used extensively. Another objection to the bottom dumps is that there is seldom clearance room over the rails for the hopper doors so the car cannot be moved until the doors are raised up and locked. When operating a train this means a considerable wait after dumping cars. Even with one car and with the doors clearing the track the doors must be wound up before the car can be loaded again.

Some side dump cars are also hopper shape with a small door or gate on the sides at the bottom of the hopper. These are operated easier than the regular drop bottom hoppers. The gates on this type of car are sometimes put on the ends of the hoppers instead of the sides so that the load is dumped under the track as with the drop bottom. In selecting this type of car close attention must be paid to the angle or slope on the sides of the hopper, otherwise the material will not run out by gravity and it will be necessary to have men with shovels clean out the car. This means an added expense.

The type of side dump car in most common use is a tipple car. That is,

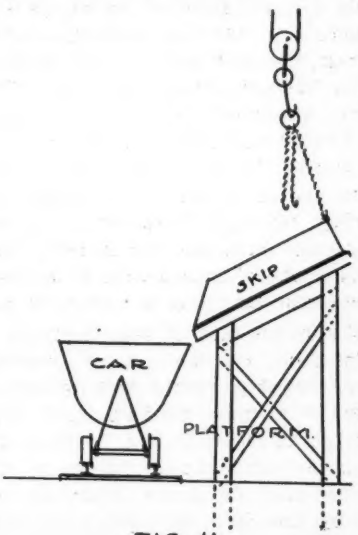


FIG. 1.

the body of the car tips over, thus discharging the car. The cars are of two kinds, a one way side dump car, only dumping on one side, and the two way dump, discharging the load on both sides, but only one side at a single dump. Some patented two way dumps can discharge part of the load at either side.

The two way dump car is the one in most common use, and these run in capacity from a cubic yard up to 50 cubic yards, but the larger sizes have their dumping mechanism controlled by air, operated from the locomotive. The smaller sizes are dumped by hand and latched up again in the same manner. A well built, well balanced car can be run on a track when tipped over for dumping as well as when in the proper position for loading, but the smaller cars that are operated by hand must be stopped to be latched up.

These cars have their sides on a swing hinge made of long steel bars, so that as they are dumped the doors swing up while the bottom goes down. There is another type of side way dump car, that shown in outline in the sketch in Fig. 1. This is a rocker dump and the load is discharged from the top over the side, and loaded in the same way. The cars are frequently spoken of as V-shaped and are generally an all-steel car. They have been used quite extensively in some sections of the country in quarries and in sand pits.

These are all of the general types of cars that are adopted to use in pits and quarries. They are made in many varying designs and sizes, but the special designs are for extraordinary conditions. It is not possible to describe and illustrate all the designs and shapes in one article. Some of these will be shown later.

There is one other type of small car that has not been mentioned and that is the rotary dump car. This car body swings around on its truck through an arc of 360 degrees and thus can be loaded and dumped from any angle. Thus it can be loaded from the side and dumped from the end or vice versa. It is only used for small operations, but it has a decided advantage in some places.

Another and the last consideration in selecting cars is whether or not they are to be operated on level tracks or upon an incline. The incline will limit the size of the car and in most cases will call for an end dump car. It likewise means that gates must be used on the car to keep stone or other material from falling out.

It is not always possible to arrange the tracks to suit all conditions when an incline is used as when tracks are laid level on the ground. An incline may be used to pull up loads as from pits, and also for loads to run down when the bank or ledge is located above the plant. The same type of cars can be used in each case.

Talc and Soapstone Bulletin

The Bureau of Mines has added to the fund of material which it is making available with reference to the mineral industries, by the recent publication of an extensive bulletin on talc and soapstone.

As would be expected, this bulletin is written by Raymond B. Ladoo, who has specialized in this subject, and it takes up the mining, milling and uses of these products to the extent of 130 pages.

This bulletin, No. 213, gives all the information on these materials one could ask for and is a notable addition to mineral literature.

The Niagara Gypsum Co., of Buffalo, N. Y., has increased its capital from $150,000 to $1,000,000.

The Sisquoc Gravel Pits, Santa Barbara, Cal., have just completed the installation of one of the best equipped gravel and sand washing and screening operations on the Pacific coast. Mr. F. H. Gates is the owner of these pits.

Road Building Delayed

Political Fight in Ohio Holding Up Much Needed Work

By Our Cincinnati Correspondent

An open break between Leon C. Herrick, Ohio state highway director, and Governor A. V. Donahey, in which Mr. Herrick has been asked to resign his position, has almost completely stopped highway construction in Ohio and is occupying the center of the attention of the basic material industry of Ohio as well as the political discussion.

The governor's demand for the resignation followed closely on the heels of his written statement to the state senate in which he declared that the road material interests were said to have a stranglehold upon the highway department as now operated.

Governor Donahey in his remarks to the highway director showed where the estimated costs for a road near Cleveland was $106,000 a mile, while a road near Cincinnati was to cost $87,000 a mile. Governor Donahey says that if such expensive roads are to be built the counties should bear the expense. He further asks that in every case where bids are asked for expensive brick and concrete roads, bids be likewise received for cheaper types such as macadam or gravel. Finally the governor has refused to permit the state director of finance to pay money on old contracts awarded by the highway director, and as a result practically the entire plans and program of the state roads have gone asunder.

When Director Herrick, who is a Republican holdover, while Governor Donahey is a Democrat, refused to tender his resignation, the governor has of late shown a better attitude toward co-operation with the highway department, and it is now hoped that the road program will soon go forward.

While state roads are not progressing, federal and county appropriations are moving right along. This month a number of contracts were awarded by counties in southern Ohio for concrete roads, and Secretary of Agriculture Henry C. Wallace has granted Federal aid in road building in Clermont, Jackson, Washington, Fostoria, Fremont and in a few northern counties.

The outlet for basic materials in Ohio is greater than usual this spring. The main cities of the state are enjoying building booms, such as they have never experienced before. The city of Cincinnati continues to show an increase over the first quarter. In fact building construction in Cincinnati according to statistics for the first three months is double the amount of the corresponding period of 1922 and 1921. This has contributed greatly in the increased demand for sand, gravel, cement and stone. Prices are ruling firm, and tending slightly upward, a factor which in some cases is causing buyers to study closely the situation and causing hesitation in closing contracts. While no actual shortage of supplies is noticeable, cement manufacturers practically have withdrawn quotations from the market, and with shipments of cement only fair there seems little opportunity to accumulate any surplus stocks.

Prices in most cases continue as the same scale as last month. Washed gravel at $1.50 f.o.b. cars, sand at $1.20 f.o.b. cars are present quotations. The main change in prices this month is a $1.00 raise in lime per ton. As all sand and gravel pits are being worked, this material is 25c lower, as it is shipped direct from the pits, and the 25c charge to transport sand and gravel from stock piles which was in vogue over the winter is now omitted.

The river operations of the T. J. Hall Company are increasing each week. Mr. Hall reports that not only is business satisfactory at the present time but that business on the books over the summer will be sufficient to allow full operation. The high water handicap of the past winter has now passed, and improvement is steadily looked forward to.

Four of the five operations of the Ohio Ballast Gravel Company are being worked at this writing, and close after the first of May the fifth pit of this company will be started again according to Mr. E. Zimmerman, manager. The greatest part of the production of the Ohio Ballast Gravel Company finds its way in the form of ballast for the railroads. The roads are buying more ballast this spring than in many past seasons. The Ohio Ballast Gravel Company has contracts to supply ballast within a radius of 150 miles of Cincinnati for the B. & O., Big Four and L. & N. railroads,

Sand Ass'n. Activities

Campaign for Suitable Concrete Aggregates Progresses

By Our Washington Correspondent

The National Sand and Gravel Association's nation-wide campaign for the use of suitable materials in concrete construction is progressing favorably and promises to show excellent results, according to T. R. Barrows, executive secretary. In connection with the campaign, Mr. Barrows states that in two important instances in widely separated parts of the country the National Association has secured the elimination of unsuitable materials and substitution therefore of sand and gravel that will mean the construction of enduring concrete in these particular and important instances. The attitude of the National Association toward the suggested conference of the construction industry is stated by Mr. Barrows to be as follows:

"Due to the agitation which has followed Secretary Hoover's letter to the President recommending that the government hold off its building work at this time, it is reported in some quarters that the President is considering the calling of a conference of the construction industry for the purpose of determining whether 'it is advisable to devise ways and means of curbing tendencies toward runaway prices.' It is considered by many that the calling of such a conference would be disastrous. Whether purposely or otherwise, it would give an impression that the price of building materials had reached unreasonably high levels, and that the President, recognizing this, was attempting to force price reductions.

"The latest figures of the Department of Commerce indicate that the price of gravel delivered on the job increased only four points in February, 1923, as compared with February, 1922. This is certainly not an unreasonable increase when it is considered that there were severe transportation difficulties in the industry at that time and that an unusually prolonged winter had prevented many producers from opening up their plants. It would seem that this year at least the government might abstain from interfering with the building industry, either through priority orders or efforts to beat down prices of materials through 'conferences,' which never have accomplished anything and never will."

Consideration of plans for the 1924 annual convention of the association will occupy part of the time of the executive committee at its next meeting. It is said at headquarters here that there is already a strong sentiment among the membership for holding the next annual meeting at St. Louis. It is believed that not less than 300 actual producers of sand, gravel and crushed stone will attend the meeting.

The Department of Commerce announces that, according to reports made to the Bureau of the Census, the value of products of establishments engaged primarily in the manufacture of brick, tile, terra-cotta, fire-clay products, non-clay refractories, and pottery amounted to $278,546,800 in 1921, as compared with $283,342,100 in 1919 and $172,864,000 in 1914. For the "brick, tile, terra-cotta, fire-clay products, and non-clay refractories" industry, the value of products reported for 1921 was $194,329,400, which was a decrease of nearly 7 per cent from 1919, but an increase of 43 per cent for the seven-year period 1914 to 1921. For the "pottery" industry, the value of products in 1921 was $84,217,400, which was an increase of 12 per cent over 1919, and 128 per cent for the seven-year period, 1914-1921.

Of the 2,151 establishments reporting in 1921 for the two industries combined, 354 were located in Ohio; 295 in Pennsylvania; 122 in Illinois; 113 in New Jersey; 109 in New York; 105 in Indiana; 87 in Iowa; 65 in California; 60 in North Carolina; 58 in Missouri; 55 in Texas; from 25 to 49 each in Alabama, Colorado, Connecticut, Georgia, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Tennessee, Virginia, Washington, West Virginia, and Wisconsin; and the balance were distributed among 23 other states.

Authority for completion of the topographical survey of the United States, now being made by the Geological Survey, a work which would mean much in the development of good roads, is to be asked of the new Congress. A measure providing for completion of this survey, was intro-

duced by Representative Henry W. Temple, of Pennsylvania, but as action upon it at the last session did not materialize, it is likely it will be introduced at the next session. The Temple bill empowers the President to utilize existing government agencies in this work, provides an appropriation of $950,000, and authorizes cooperative agreements with and the receipts of funds from any state or civic subdivision.

A large stone-cutting plant that will give employment to 200 skilled mechanics will shortly begin operations in Alexandria, Va., just across the Potomac River from Washington. The promoters have purchased the old Agnew shipyard, at the foot of Franklin street. The stone will be hauled to Alexandria on barges from Aquia creek. The quarries at this place have been abandoned for more than a century. New York, Washington and Richmond capitalists are said to be interested in the enterprise. The promoters have already placed orders for two traveling cranes and have made negotiations for the purchase of barges. The central portion of the United States Capitol, the first section of the Treasury Department, the old patent office and the Post Office Department buildings on 7th street were, with many other of the first public buildings in Washington, erected from blocks cut from stone ledges on Aquia creek.

National Slate Meet

Important Matters Considered at New York Gathering

The meeting of the National Slate Association, held on Friday, April 20th, at the Commodore Hotel, New York City, may be considered among the important meetings of that body. Matters of vital concern to quarry managers, producers and distributors were discussed and action was taken that will undoubtedly benefit the industry in its various units.

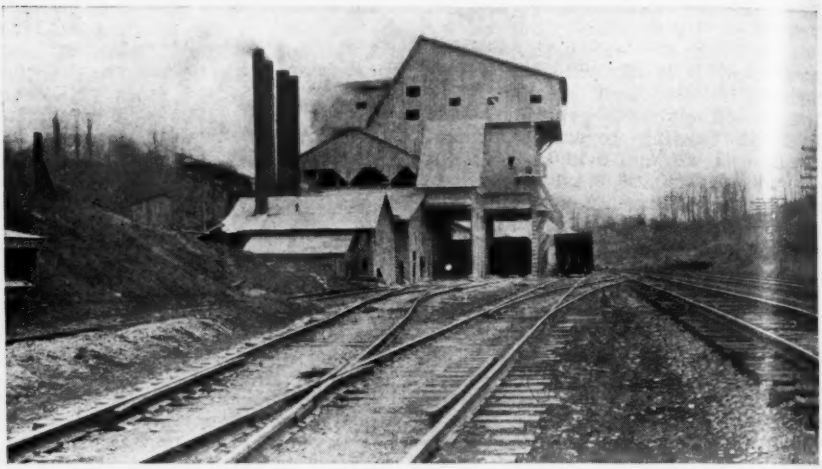
The features of the program were a very good paper by the Chicago Director, Mr. C. H. Davis, reports of the Advertising Counsellor, Traffic Manager and Better Production Methods Committee. The Electrical Slate Producers held a special conference before the regular meeting at 10:30. At the beginning of the general sessions was a discussion on the question, "What is the sales policy and how can good relations be established with jobbers, dealers, roofers and other slate contractors?" This discussion was led by Mr. E. L. Seabrook of the National Metal Contractors Association.

After this the Credit Recommendations Committee made its report on the kind of information service that the association should furnish. Then came discussion of the nature of slate exhibits, where they should be placed, and what should be the basis of cooperation of members in supplying necessary specimens for samples.

The report of the Better Production Methods Committee considered the development of the wire saw for use in quarries and the adoption of the broaching method of channeling which will do away with the large amount of slate shattered by the use of channeling machines. The diamond tooth saw and the carborundum tooth saw were also considered, but it is stated that experiments with these have not yet been carried along to an extent that would lead the Committee to recommend immediate installation of saws of this type, but the Committee feels that there are possibilities that have not yet been developed. The Committee recommends consideration of the possibility to increase the number of working days and thus allow the laborer to feel some certainty of working at his trade. The larger use of machinery is the great need of the industry as a whole. If the association members are willing to install improved machinery for all operations, machinery builders will take up the subject and by experiment, develop improved machinery for the quarry man.

Under the head of election of officers, the attending membership returned the officers of the last year and added to the present list of directors the name of Mr. W. S. Ditchett of the Columbia Bangor Slate Company of Bangor, Pa.

The Sterrett Sand and Gravel Co. has been incorporated at Springville, N. Y., with a capital of $20,000. The incorporators are F. W. Sterrett, W. Sunderland, H. A. C. Grotke, and H. A. Ward, attorney.



View of Plant of Blue Ridge Quarry Co's Plant Taken from Scale House

Quarrying Blue Ridge Limestone

An example of a crushing plant that has been driven hard, and is still standing up and giving good service is furnished by the plant of the Blue Ridge Quarry Company at Blue Ridge Springs, Va. This operation is one of a group of similar ones controlled by Mr. W. W. Boxley of Roanoke, Va., a well-known member of the National Crushed Stone Association. In addition to the Blue Ridge plant the Boxley interests include quarries at Pembroke and Pounding Mill, Virginia.

The activities at the Blue Ridge quarry are under the direction of Mr. J. B. Dunkin, superintendent. Mr. Dunkin came into the business of commercial crushed stone production from the railway field. He is an experienced rock man and has come out more successfully than some railroad men who enter the commercial crushed stone business. His change from one phase of stone production activity to another brings to mind a statement of Mr. W. H. Finley, president of the Chicago and Northwestern Railway Co. At the annual banquet of the National Crushed Stone Association in Chicago last January, Mr. Finley said that, because a railroad is an operating and not a manufacturing operation and because railroad men have a training that is different from that of quarrymen, they do not make good quarrymen. Mr. Dunkin's case seems to be one of the exceptions to the rule.

At this operation there is a practically unlimited supply of material. A whole mountain of limestone lies ahead of the quarry in the direction of present development. Tests have shown that there is a supply of limestone underneath the floor of the present quarry to a depth of 200 feet. If the Blue Ridge quarry is closed down any time during the next hundred years or so, it will hardly be for lack of stone.

The material itself is a hard blue limestone. The inclination of the strata is about 40 degrees. The bedding is contorted in many cases and makes drilling and blasting difficult matters. The quarry face, as exposed at the present time, runs from 30 to 140 feet in height. At points of the quarry where this high face is exposed, development is carried forward in 30 foot benches.

Tripod drills and well drills are used in blasts. Snake holing is resorted to in about every shot to clear away the face clean down to the quarry floor. At the present time, most of the drilling on the faces is being done by the tripods and a Sanderson-Cyclone gasoline drill is used for well drilling on one face. A Clipper well drill and a Keystone well drill, both powered by steam, are be-

ing used to drive 5 inch holes preparatory to blasting for a new quarry floor level. The air equipment used includes 5 D44 Ingersoll-Rand tripod drills and a number of B 13 jack-hammers, also the product of the Ingersoll-Rand Co.

At the present time stripping is being carried on by a No. 31 Marion dipper. The stripping is being done at the end of the quarry nearest the plant and alongside the industrial railroad on which the stone is hauled. When this stripping is finished and the stone underneath has been shot away, the quarry will be opened up a great deal and better haulage methods made possible.

Six-yard dump cars are used for conveying materials. These are of the side dump type, and discharge either to the right or to the left. There are 18 of them in the fleet. Six are products of the Kilbourn & Jacobs Company and six of the Western Wheeled Scraper Company. These are hauled by steam locomotives of which there are four—a Baldwin, an American, a Porter and a Vulcan. The haulage system is standard gauge, making it posible to use any of the locomotives for spotting railroad cars and for handling the other work for which standard gauge equipment is required.

After the stone has been blasted down by 40 and 50 per cent dynamite it is picked up by a No. 61 Marion shovel with a 2½ yard bucket. Trains of the 6-yard cars hauling the excavated stone are then drawn to the plant and dumped at approximately the level of the quarry floor. Dumping is done by a Curtis air hoist, located in the ground and operating a rod which tips the car to discharge its load.

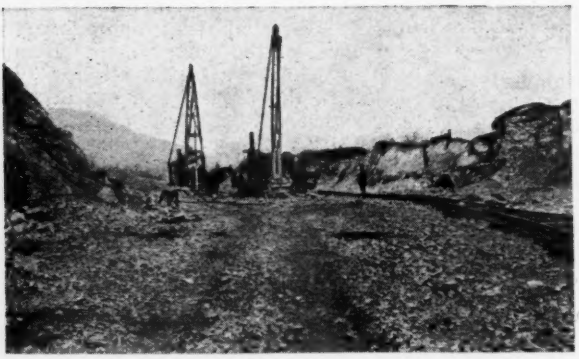
The material goes first to a No. 12 Allis-Chalmers crusher. Another air hoist is provided at this point to handle stones that jam or bridge at the crusher opening. The No. 12 crusher is set to reduce stone to 2-inch size.

From the No. 12 crusher, the material goes to a bucket elevator 100 feet between centers and with buckets 32 inches wide, the whole operating at an angle of about 45 degrees. This elevator discharges at a rotary screen 60 inches in diameter and 16 feet long, equipped with perforated metal with 2-inch openings. The minus 2-inch stone from this screen goes to four 48-inch finishing screens with 4 sections each, from which are secured minus ½-inch, plus ½-inch minus 1-inch, plus 1-inch minus 1½-inch, and plus 1½-inch minus 2¼-inch.

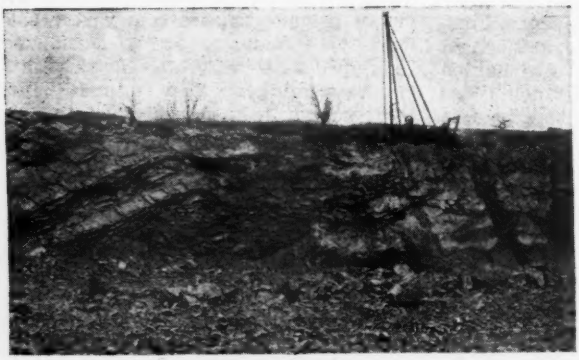
Material rejected by the 60-inch screen is taken up by a No. 8 Allis-

A "Shot" at a Point in the Quarry Near the High Face

Chalmers crusher. The product of this machine goes to a bucket elevator, 90 feet between centers and with buckets 30 inches wide. This elevator discharges at two 16-foot by 48-inch rotary screens, which send to the bins a product ranging from between ½-inch and 2 inches. Rejections are taken up by a 30-inch belt conveyor, 50 feet between centers and carried to a No. 37 Kennedy gearless crusher which gives a product of plus ½ inch minus 1¼ inch. This goes direct to bins.



Clipper and Keystone Steam Well Drills at Quarry Floor

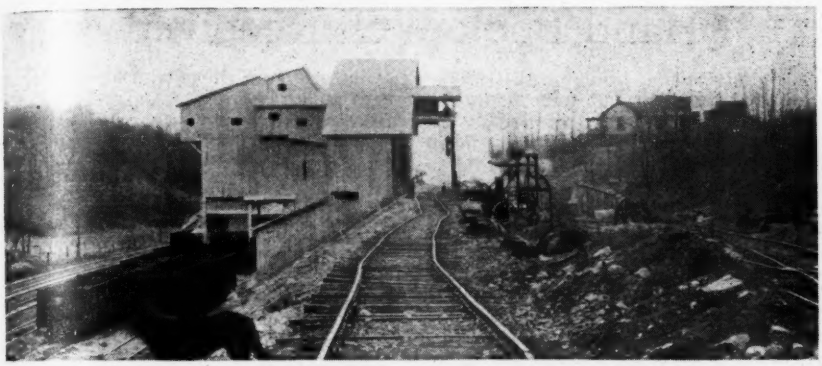


Part of Face is Worked by Well Drills.. A Sanderson-Cyclone in Action

The Highest Point of the Face. 140 Feet High

Rejections from the 60 inch by 16 foot screen used at the beginning of the process go to a 24 inch belt conveyor, 80 feet between centers which takes the stone to a 48 inch screen, 16 feet long equipped with metal perforations. The product of this screen goes to a bin containing stone from ½ to 1-inch, and the rejections to a bin of their own from which they are drawn off as a separate product.

Power is furnished to the plant by three boilers operating at about 110 pounds pressure and delivering about 375 H. P. These boilers, manufactured by Houston, Stanwood & Gamble Company of Cincinnati, are equipped with shaker grates made by the Princeton Foundry Company, of Princeton, West Virginia. They drive 2 Corliss engines, which turn over the machinery of the plant. One of these engines takes care of the No. 12 crusher, the 60-inch screen and the 100-foot elevator, the first three pieces of equipment in the process. The other engine moves all the other machinery. From the boilers is also run an Ingersoll-Rand compressor that feeds a



View of the Plant from Direction of Quarry—Quarry Track in Foreground

tank at the plant. From this tank is run an air line to another tank in the quarry. Air lines from this quarry tank are used to operate the air tools.

A standard gauge supply track running past the plant and up to the quarry, permits the convenient handling of coal for the power plant. This track runs beside and above the coal bins, and fuel is very easily unloaded. This supply track running back to the quarry also results in other conveniences, such as the easy transportation of machinery received from the railroad and intended for the quarry.

There is at this quarry a very convenient loading track arrangement. Cars are taken in from the main line of the Norfiolk & Western Railroad and passed to one or another of the three loading tracks, running under the stone bins. Of these three tracks, one is used for loading ballast, another for commercial sizes and concrete mixes, and the third for small stone and dust. The track has a capacity of 65 empties. At the outside of the track arrangement there is space for 85 loaded cars. Loaded cars pass by a scale house in which the weight, as shown by a Fairbanks-Morse track scale, is read by a representative of the railroad who issues a receipt to the quarry.

The Consumers Sand Co, of Allis, Neb., and the Central Sand Co., of Central City, Neb., both operated by Trenmor Cone, of Waterloo, Neb., have been consolidated and incorporated under the name of the Consumers Sand Co. Trenmor Cone, president; G. H. Gray, vice-president.

The Pittsburgh Plate Glass Company of Pittsburgh, Pa., is engaged at the present time in putting in the foundations for a new 2,500 barrel cement plant at Fultonham, Ohio, which they expect to have in operation within the next year. The company is doing the engineering work themselves, working in conjunction with the J. C. Buckbee Company, who are acting in the capacity of consulting engineers. The contracts for practically all the buildings and machinery, including the boilers and power house equipment, have been let. The installation includes waste heat boiler system to generate steam from the waste heat of the kilns.

The Pilot Knob Gravel Co., Winchester, Ky., has decreased its capital from $250,000 to $160,000, and changed its name to the Pilot Knob Sand and Gravel Co.

The Standard Scale & Supply Corp., of 1631 Liberty Avenue, Pittsburgh, Pa., has purchased, and is now operating under entirely different management, the business formerly conducted by the Standard Scale & Supply Co. This new corporation, which has branch offices in New York, Philadelphia, Cleveland and Chicago, is preparing to manufacture the highest grade scales, concrete mixers and contractors' equipment. R. H. Chappel is secretary-treasurer.

The Fairmont Sand Co., has been organized at Fairmont, W. Va., with a capital of $50,000. Dalton D. Simon, Mona Simon, S. C. Board, D. W. Carpenter and S. B Miller, all of Fairmont, W. Va.

Hand Book Well Received

The distribution of PIT AND QUARRY Hand Book throughout our industries during the past month has already established itself as an event of more than ordinary importance. The attractive and permanent make-up of the volume in well-bound hand book style, has been a pleasing surprise, as this was scarcely expected in view of the free presentation of a copy to every producer in the United States and Canada.

This is the first time in the history of the pit and quarry industries that such a work has been attempted, and its distribution on the same basis as that of PIT AND QUARRY, free to every producer in the field, and supplementing the service we have been giving for several years through our publication, is meeting with hearty appreciation.

The information contained has also been recognized at once as well worth bringing together in this easily accessible form. Here, for instance, are just a few questions which can be answered by reference to the book:

What parts of the country produce the most sand and gravel? (See map on page 28.)

How is blast furnace slag used in the manufacture of cement? (Page 35.)

How are rotary kilns used in lime plants? (Page 58.)

What is the process of preparing phosphate rock for market? (See flow sheet on page 75.)

How are demurrage charges computed? (Page 88.)

What was the date of the 1922 convention of the National Lime Association, and where was it held? (Page 103.)

Who is president of the Talc and Soapstone Producers Association? (Page 109.)

What is the treatment for electric shock? (Page 113.)

How far from a public highway must we build a storehouse for 8,000 pounds of dynamite? (Page 117.)

How much glass sand is produced in the United States? (Page 124.)

What is a drag twist? (Page 163.)

What horsepower is required to run an air compressor with a piston displacement of 250 cubic feet per minute at a pressure of 125 pounds? (Page 193.)

What is the weight of a rocker dump car, 40 cubic feet capacity, 36 inch gauge? (Page 205.)

How is wire rope made? (Page 296.)

Who and where is the nearest steam shovel salesman? (Page 305.)

Who makes dust collecting systems? (Page 317.)

Where can we get special motor truck bodies? (Page 321.)

Who makes the Keystone drills? (Page 328.)

That this mass of information is appreciated is attested by a multitude of letters from those who have received the book. Here are extracts from a few:

This book is well dressed, polite and sociable. It is a first-class information bureau and one of the greatest chapters ever written for our industry. PIT AND QUARRY has pitched a ringer.—A. P. Sandles, Secretary National Crushed Stone Association.

Please accept our thanks for the Hank Book recently presented to us. It is replete with useful and valuable information, so that when we say we appreciate the courtesy shown we express it but mildly.—C. H. Kammann, General Manager Ste. Genevieve Lime Company, St. Louis.

We wish to thank you for the Hank Book which you mailed us a few days ago. It is certainly very complete in every detail and we appreciate it very much.—Central Wisconsin Supply Co., Beaver Dam, Wis.

We desire to thank you for copy of 1923 Hand Book, which we are sure will prove very useful to operators of sand, gravel and stone plants.—R. B. Tyler Company, Louisville, Ky.

In this morning's mail it was my pleasure to receive a PIT AND QUARRY Hand Book for 1923. In glancing through this publication it appears to be chuck full of interesting and valuable information and I wish to thank you for your kindness and generosity in sending it to me.—W. M. Gray, Louisville Cement Company, Louisville, Ky.

I received your PIT AND QUARRY Hand Book, and wish to congratulate you on getting up a volume with such a mass of satisfactory detailed information.—J. F. Schroeder, Linwood Cement Company, Davenport, Iowa.

We wish to acknowledge with thanks the copy of the Hand Book for 1923. We will keep same on file for future reference. At times when we order any equipment shall be glad to mention the Hand Book.—Clinton Sand & Gravel Co., Clinton, Iowa.

We have received copy of your 1923 PIT AND QUARRY Hand Book, for which we thank you and wish to congratulate you on the completeness of the same. This information should be of material benefit to all producers and others interested in the industry.—N. K. Wilson, Executive Secretary Wisconsin Mineral Aggregate Assn., Milwaukee, Wis.

Within the past few days I have received a copy of PIT AND QUARRY Hand Book for 1923 published by your company, which is quite the niftiest offering that I have gotten my hands on for some time.—H. J. Love, Secretary-Treasurer National Slag Association, Cleveland, Ohio.

Manufacturers taking catalogue space in the book are also well pleased. One of them got an inquiry from the book before his own copy reached him, as related in one of the letters reproduced below:

We have your letter of the 17th in reply to our telegram, inquiring when we may expect Hand Book. Our reason for requesting copy at once was due to an inquiry we received and mentioning the fact that ad was seen in the PIT AND

QUARRY Hand Book. Thinking perhaps the book was already distributed and some slip made in mailing us copy, prompted us to wire. Needless to say, the ad took immediate effect and we wish to take this opportunity of congratulating you upon the very attractive and well edited Hand Book treating on this field.—Arnold & Weigel, Woodville, Ohio.

We wish to congratulate you on the PIT AND QUARRY Hand Book which arrived this morning. This is certainly a credit to your organization, as it is not only attractively bound but well printed and contains a wealth of good information covering the entire field. We are indeed pleased that we took hand-book space sufficient to let one properly "peep" at our line, as we note that some of the cuts used by various advertisers are entirely too small to give an adequate idea of just what they represent.—Morris Machine Works, Baldwinsville, N. Y.

British Quarry Men

Will Hold Annual Meeting in June at Llandudno, North Wales

The annual conference and general meeting of the Institution of Quarry Managers of Great Britain will be held at Llandudno, North Wales, on June 28, 29 and 30. The program includes visits to limestone, roadstone and slate quarries and an explosives factory.

Among the papers to be read at the conference are:

"Portmadoc Slate as a Roofing Material." by Capt. E. Andrewes.

"Liming the land—the importance of Agricultural Lime." by George Mann Watson, B.A.

"Lime-Burning — the Economization of Fuel." by Dr. Oliver Bowles, Bureau of Mines, U. S. A.

"What is the Best Aggregate for Tar-Macadam." by A. B. Searle, Consulting Technologist, Sheffield.

The president, Sir Henry P. Maybury, Director of Roads, Ministry of Transport, will take the chair at the annual general meeting on Friday, June 29, at 3:00 p. m. and will preside at the annual dinner on Friday at 7:30 p. m. Headquarters will be at the Marine Hotel, Llandudno.

Any American managers who are in England on the dates mentioned are given a cordial welcome to attend the conference. Further particulars will be gladly given to those interested, on application to the secretary, Barclays Bank Chambers, Carnavon, North Wales.

Agstone Research Man

Prof. Firman E. Bear, chief of the soils department, Ohio State University, has secured the services of Carl W. Vandervort, who will graduate from the College of Agriculture this summer, to do review and research work for the Ohio group of the National Agstone Association.

His monthly bulletin will be a thorough review of what is doing in agstone throughout the country. This service will be paid for by the Ohio group, but a copy of this bulletin will go to the entire membership of the National Agstone Association.

Prof. Bear advises that he and other members of the faculty of the State University will censor and approve Mr. Vandervort's bulletin before it is broadcasted. This practically insures Agstone producers that this bulletin will be official and along safe and scientific lines which both producer and purchaser will be safe in following.

Some members will order from 500 to 2,000 copies of this bulletin to be distributed by them in their territory.

Lime Convention in New York

The fifth annual convention of the National Lime Association will be held at the Hotel Commodore, New York City, June 13, 14 and 15, 1923.

The work of the convention will be devoted in a large measure to reports from the technical men of the research organization, and from the field engineers of the association.

Robert F. Eissler, who during the past two years has filled the position of assistant to the vice president of the Chicago Pneumatic Tool Company, New York, being desirous of doing more active sales work, at his own request has assumed his former position as district manager at Pittsburgh. The appointment is announced of Nelson B. Gatch as assistant to vice president, headquarters at New York, succeeding Mr. Eissler. Appointment is also announced of William C. Straub as district manager at New York, to succeed Mr. Gatch, promoted.

Big Texas Program

Will Take All Materials That Producers Can Get Out

By Our Dallas Correspondent

Increased building operations and greater activity in road building and street paving have served to increase the demand for sand, gravel and other building materials in Dallas and other Texas cities. Building operations are especially active in Dallas at this time, and most of the building is of such construction that large quantities of sand and gravel are being used. Numerous Texas counties are just now entering upon their road building programs, work having been delayed during the winter months, and other counties are preparing to vote bonds or have already voted bonds and these are to be sold before construction of highways begin.

Gravel dealers in and near Dallas report that they are hard pressed to keep up with orders, and in some cases delays in deliveries result from their inability to meet the demand made upon their plants. All the gravel pits are working full time.

The spring so far has been favorable for working gravel pits, as there has been no flood and the pits have remained practically clear of water. Rains have made roads near Dallas difficult of passage and have thus hindered the gravel business where deliveries are made by truck, but the trade as a whole has suffered little inconvenience on account of rainfall.

Prices have remained firm, with a slight tendency to advance as the demand for sand and gravel has increased. Gravel f. o. b. pits in Dallas is quoted at $1.50 to $2.00 per cubic yard. Sand is quoted at the same prices for the pit-run product, while washed sand is quoted at practically double this figure. Most of the concrete work in Dallas is done with pit-run product, as the gravel found in most of the pits near Dallas is mixed in proper proportions of sand and gravel for good concrete work, and the contractors save the expense of handling sand and gravel separately and then mixing them in the making of concrete.

Ballinger, Texas, is fast developing into an important gravel market center, and large gravel pits are being opened along the Colorado river in that section. Gravel from these pits is being shipped to all parts of west Texas. The Colorado River Gravel Company has recently delivered 100 carloads of gravel to the City of Abilene for street paving work. One hundred carloads of gravel were shipped to Winters, Texas, for paving work. Coleman county has contracted for 400 carloads of gravel for road construction in that county.

Numerous highway construction contracts in various parts of Texas have been awarded recently. Smith Bros. of Dallas, Texas, were awarded contract for building the Meridian Highway through Frio County. This contract calls for expenditure of approximately $750,000 and will consume several hundred carloads of gravel.

County Commissioners of Fayette County, sitting at Lagrange, awarded contract for graveling roads in Fayette county to Kelly & Co. of San Antonio, for $42,504.20.

The Julian C. Field Construction Company of Bonham, Texas, was awarded contract for building 5.78 miles of concrete highway near Honey Grove, for $174,629.57.

Dallas County Commissioners awarded contract for construction of the Irving-Coppell highway to Scarborough, Smith & Davis of Dallas, for $306,000. The road will be built with a crushed rock foundation with a surfacing of one-inch cold mix asphalt for eight miles, while the other sixteen miles will be of gravel construction.

A shortage of gravel is reported in Houston, Texas, due to the heavy demand resulting from building operations. Most of the gravel used in Houston is shipped from pits near Columbus, Texas, and the pits there have been overworked in an effort to meet the demand. Large building operations in Houston include the 1,500 foot concrete wharf on the Houston Ship Channel, the million dollar reinforced concrete cotton concentration plant and the Masonic Temple.

Liberty County has awarded contract for construction of a 34-mile stretch of concrete highway through the county, for $414,000. The Tibbetts Construction Company has the contract for culverts and bridge work.

W. M. Jagoe & Co., of Denton, Texas, has been awarded contract for paving West Oak Street in Denton

for a distance of more than one mile. The paving is to be of crushed stone foundation with a two-inch surfacing of rock asphalt.

The city of Sherman has entered upon an extensive paving program, and contracts covering the paving of about five miles of streets have been awarded to McGuire & Canvendar, paving contractors of Sherman.

Stephens County, Texas, has awarded contract to W. S. Davidson for building a gravel highway, 8 miles in length, from Breckenridge to Wayland, for $18,846.

Tyler County, Texas, awarded contract to the Sherman Road Construction Company of Houston, for building a highway with crushed rock and gravel about 40 miles in length crossing the county. Native stone and gravel will be used.

On a bid of $80,514.27, Falls County, Texas, has awarded contract for construction of nine miles of hard surface highway in Falls County. The Hannar Construction Company of Waco, Texas, is the successful bidder.

The City of Commerce has awarded contract to the General Construction Company of Fort Worth, Texas, for paving several streets. A total of 30,000 square yards of pavement will be laid with an outlay of more than $125,000.

The City of Laredo, Texas, has awarded contract for pavement on 106 city blocks of its streets at a cost of $420,000.

The Womack Construction Company of Sherman, Texas, was awarded contract for building 12 miles of gravel highway in Taylor County, Texas, at a cost of $61,000.

The City of Abilene, Texas, has entered on a campaign of street improvement which includes the pavement of several streets, aggregating twelve miles of streets.

Waco, Texas, has accepted the bid of the Central Bithulithic Company of Dallas, Texas, for street pavement. The bid was $2.89 per square yard for rock base with two-inch wearing surface, with maintenance contract covering a period of five years.

Brazoria County has issued bonds in the sum of $160,000 for construction of highways, and will begin building gravel and shell roads.

Stamford is building 5,346 lineal feet of gravel highway, cost of which is being borne by the business men of the city.

Dallas, Texas, has contracted to purchase 3,000 tons of crushed stone from the Thurber Earthern Products Company of Thurber, Texas, at $2.40 per ton. The stone will be used in construction of the Turtle Creek Boulevard.

Galveston County, Texas, has contracted to purchase 10,000 tons of mudshell, which is used in the construction of roads on the Texas Coast in lieu of gravel. The contract price was 65c a ton in cars with state tax paid.

No Salaries In Ohio

Sand and Gravel Association Reduces Dues Accordingly

The annual meeting of the Ohio Sand and Gravel Producers' Association was held at Columbus on March 28.

A considerable part of the session was devoted to outlining definite plans for the present year.

One action taken was the adoption of a resolution setting forth that, "beginning with January, 1924, the Ohio Sand and Gravel Producers' Association shall discontinue paying any salary to any of the officers of the association and that the fee for each member shall be a nominal fee of $25 a year."

It is expected that this policy will result in the enrollment of every sand and gravel producer in the state.

The officers for 1923 are as follows:

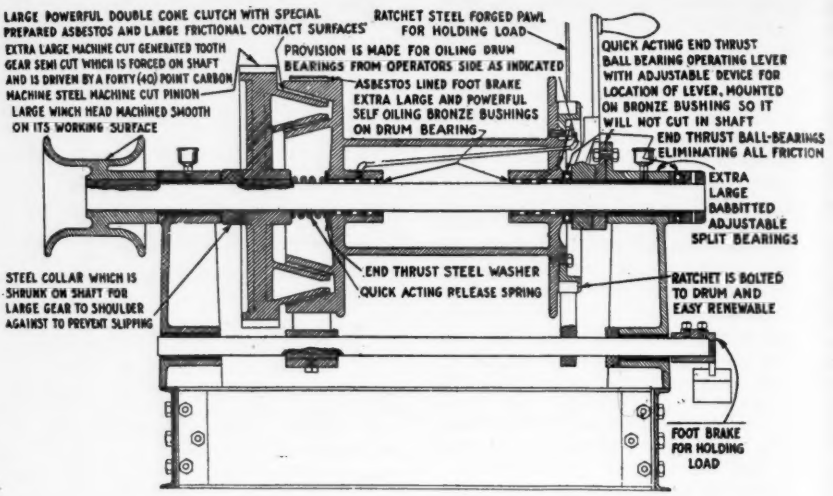
President, F. E. Hall, of T. J. Hall & Co., Cincinnati.

Vice-President, E. A. Evans, of Zanesville Washed Gravel Co., Zanesville.

Secretary-Treasurer, F. C. Fuller, Portsmouth Sand and Gravel Co., Portsmouth.

Executive Secretary, Guy C. Baker, Greenville Gravel Co., Greenville.

The plant of the Mid-Coast Rock Company, Santa Barbara, Cal., is rapidly nearing completion. The latest types of equipment for handling the rock are being installed and a spur line is being built from the main line of the Southern Pacific Railroad Co. so that the rock can be transferred direct from the crusher to the cars. Mr. A. W. Belmont is vice-president and general manager.


LARGE POWERFUL DOUBLE CONE CLUTCH WITH SPECIAL PREPARED ASBESTOS AND LARGE FRICTIONAL CONTACT SURFACES
EXTRA LARGE MACHINE CUT GENERATED TOOTH GEAR SEMI CUT WHICH IS FORCED ON SHAFT AND IS DRIVEN BY A FORTY (40) POINT CARBON MACHINE STEEL MACHINE CUT PINION
LARGE WINCH HEAD MACHINED SMOOTH ON ITS WORKING SURFACE
RATCHET STEEL FORGED PAWL FOR HOLDING LOAD
PROVISION IS MADE FOR OILING DRUM BEARINGS FROM OPERATORS SIDE AS INDICATED
ASBESTOS LINED FOOT BRAKE EXTRA LARGE AND POWERFUL SELF OILING BRONZE BUSHINGS ON DRUM BEARING
QUICK ACTING END THRUST BALL BEARING OPERATING LEVER WITH ADJUSTABLE DEVICE FOR LOCATION OF LEVER, MOUNTED ON BRONZE BUSHING SO IT WILL NOT CUT IN SHAFT
END THRUST BALL-BEARINGS ELIMINATING ALL FRICTION
EXTRA LARGE BABBITTED ADJUSTABLE SPLIT BEARINGS
STEEL COLLAR WHICH IS SHRUNK ON SHAFT FOR LARGE GEAR TO SHOULDER AGAINST TO PREVENT SLIPPING
END THRUST STEEL WASHER
QUICK ACTING RELEASE SPRING
RATCHET IS BOLTED TO DRUM AND EASY RENEWABLE
FOOT BRAKE FOR HOLDING LOAD

How a Hoist Works

The above illustration is of unusual interest as showing the action of a hoist in detailed fashion. It is taken from catalogue No. 20 recently issued by the O. K. Clutch and Machinery Company, Columbia, Pa., and of course shows the particular type of hoist manufactured by this company.

The O. K. line includes single and double drum hoists, for both light and heavy duty, operated by gasoline engines, or provided with pulley for belt drive.

This company also makes a combination outfit whereby a second or third drum can be added to a single drum outfit.

Anderson Factory Expands

Work has been started by the Anderson Foundry and Machine Company, of Anderson, Indiana, on a building expansion program, involving the construction of new buildings which will increase the interior space of the factory 41,000 square feet and will add 200 employees to the present pay roll. Ground has been broken and structural steel was ordered over a month ago. All buildings will be constructed of steel, concrete and glass, similar to the ones now occupied by the company. When the installation is complete it will give the company 200 per cent more capacity than it has at present.

Haiss Truck Loading Unit

The usual truck loading machine is one built complete with a digging and elevating mechanism mounted on a specially designed chassis and provided with a unit power plant. The George Haiss Manufacturing Co. of New York City has laid out its truck loader designs in such a way as to offer complete loading units for mounting on a chassis of any suitable motor truck.

The manufacturers claim for this truck that it is possible to travel at a good speed over any road, thus effecting an economy of time over the standard loading machine. It can be moved rapidly from place to place, where loose material is to be loaded, because the unit can do double duty and drive the loader as well as the truck. The loader can be mounted and dismounted as occasion requires. The unit is of lattice-truss construction. The buckets, elevator, chain and sprockets are the same as those used in standard Haiss machines. Loader units may be provided with Haiss positive self-feeding propellers which push the material directly in the path of the bucket. Standard height under the discharge chute is 9 feet.

In writing for information, operators are requested to specify the make of truck, when each truck was made, capacity and horse-power. Inquiries should be addressed to the George Haiss Manufacturing Co., 141st St. and Rider Avenue, New York City.

New Seaverns Publications

Pamphlets issued by the James B. Seaverns Company, 122 South Michigan Avenue, Chicago, describe in some detail the Seavern truck loader, Seaverns service bins and the Seaverns balanced shaking screen. These three publications also carry good illustrations of the several articles of Seaverns manufacture with which they are concerned. The bulletin on truck loaders contains a half-tone illustration and a line sketch of the device, together with text description and tabulated specifications. The folder on the shaking screen carries also a good description of this device and a print of a typical installation. The literature on service bins is very attractively prepared and shows one of the service bins at an actual operation. Copies of these various pamphlets may be had by addressing the James B. Seaverns Co., at the address given above.

Schaffer-Alles Chemical Company Introduces "Piercite"

The Schaffer-Alles Chemical Co., of 2828 Smallman St., Pittsburgh, Pa., announces that it is putting on the market a new compound, Piercite, which, when added in small amounts to hydrated lime, is said to make a perfect lime plaster that will stay uniform and harden on the wall in a few hours. The company claims for itself the rediscovery of the ancient secret of lime plaster manufacture, lost since time immemorial.

Mr. J. C. Schaffer, president of the Schaffer Engineering and Equipment Co., is president of the Schaffer-Alles Chemical Company. Mr. A. A. Alles, Jr., is vice-president and treasurer, and Mr. M. L. Kittell is secretary. Interested in the new concern are also Mr. James H. McNamara, president of the Eagle Rock Lime Co. of Eagle Rock, Va.; Mr. L. P. Dillon, president of E. Dillon Sons, Inc., Indian Rock, Va.; Mr. Douglas M. Harrison, Pittsburgh, and Mr. H. H. Pierce, Indianapolis.

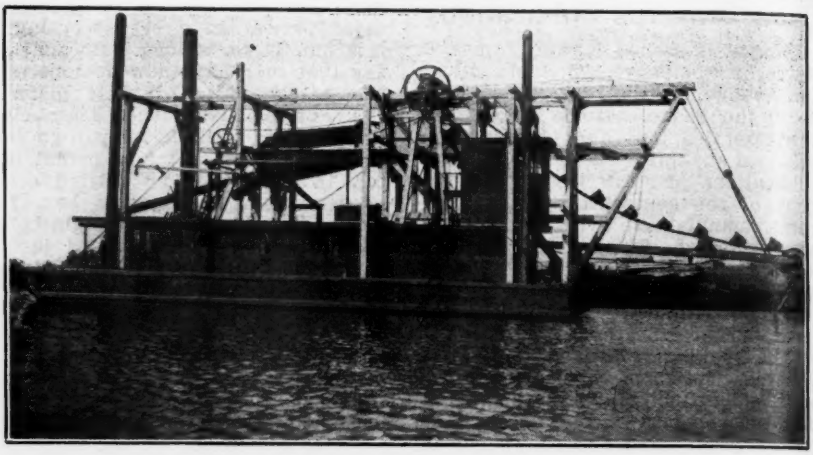
The company has already received shipments of hydrated lime from quite a number of lime manufacturers for the purpose of showing that an application of Piercite will convert it into good hard wall plaster. The interested parties have been working on this quietly for a long time and they say that they have now demonstrated the practicability of their plans to their own satisfaction. They claim that Piercite wall plaster will go more than half again as far as patent plaster, that there is no setting or no hardening in the mortar box, that mortar left over from the night before can be retempered and used just as well as the fresh mix, that Piercite wall plaster has been put on walls alongside patent plaster and at the end of a number of weeks has shown up much better, that the time of the setting of the plaster can be controlled more easily, that it will adhere to any kind of wall, and that it forms a suitable material for the making of blocks and molding.

The Schaffer-Alles Chemical Company will manufacture and sell Piercite compound to the lime manufacturers, who in turn will mix it with their hydrated lime and sell it in bags to the dealers. Further information may be secured by writing the Schaffer-Alles Chemical Company at the above address.

New Good Roads Catalogue

The new catalog just issued by the Good Roads Machinery Company, Inc., of Kennett Square, Pa., is a very fine piece of work, both as to the way in which it is edited and the manner in which it is laid out and printed. The Good Roads people call this catalog "Everything for the Road Maker," and they do not overstate the case a bit, for there does seem to be in it a description of just about everything that a road maker would require. In it, too, there is much that woud be of interest to the producer of gravel and crushed stone. The Good Roads Machinery Company's crushing, elevating and screening equipment is thoroughly described and illustrated. Copies of this attractive publication may be had by addressing the Good Roads Machinery Co., Kennett Square, Pa.

C. E. Wilfert is expecting to open a gravel crushing operation between Eugene and Springfield, Ore. Mr. Wilfert is negotiating with the Mountain States Power Co. for the construction of a power line from Springfield to the plant.



Dredge of Economical Design

The dredge here illustrated and described was recently put in service by an operating company on the north Atlantic seaboard. It was designed and built by the Ellicott Machine Corporation of Baltimore, and is of the elevator type of sand and gravel dredge. The first machine built by this company of this type was in 1906, which machine is still in successful use. During the past seventeen years these dredges have been developed and improved until today this company offers a machine which commends itself in every feature to the discriminating operator.

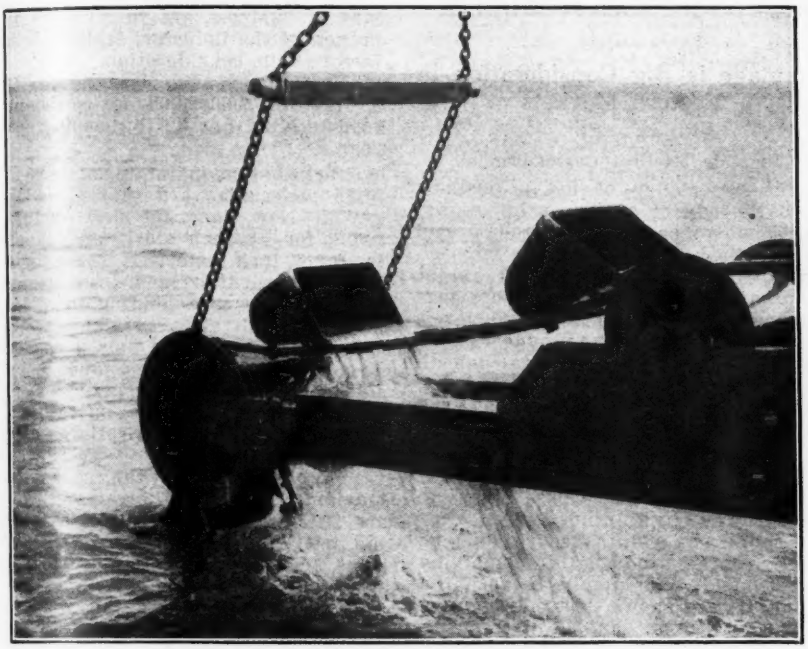
First, it is a comparatively low priced machine. Second, it can be operated by a small crew and at a low cost. Third, it can readily produce 300 tons of sand and gravel per hour. Fourth, it screens, washes and grades its products, in one operation. Fifth, the dredge can be carried over land to navigable streams by being knocked down and then assembled in the stream in which it is meant to work, while it can be towed to any place by water. These are the essential features of this successful dredge.

The illustration shows the completed dredge equipped for work with ladder raised to show the bucket line. The hull is 90 feet long and 35 feet wide and has a depth of 9 feet. Although the hull can be built of steel, yet it has been the practice to construct it throughout of sound merchantable long leaf pine. The keelson and ribs are of such size and so placed as to give the greatest possible strength and stability to the boat. These are well braced with knees. This particular machine is meant to dig a depth of 35 feet and the ladder and four spuds are of ample length to permit this. Spud wells are provided inside the hull. The winding engine that handles the boom also handles the spuds.

Living quarters are located on the main deck, and are of ample size to accommodate a crew of from 12 to 15 men. These quarters are conveniently arranged. Besides providing sleeping accommodations there is provision made for a refrigerating room, kitchen, mess rooms, bath and lavatories. Naturally the machinery, pumps and engines are installed in the hull, but the operating room is in the superstructure, being located to the right of the well, above the main house, so that the operator has a full view from this point, and thus controls all the operations. The heavy frame work, shown in the photograph, supports the elevator and screens, and is so constructed as to distribute the load as evenly as possible over the hull, thus making the dredge seaworthy.

The boiler is of economic type, being 125 H. P., built according to the standard A. S. M. E. specifications, for 100 pounds working pressure. This and a 15 H. P. donkey boiler furnish ample steam for all the work. With the exception of a few commercial articles, the dredge is an Ellicott product throughout, both in design and construction.

The boom with the excavating buck-



ets and elevator on it is 50 feet long, and is operated by the winding engine. One of the photographs shows a view of a bucket line, there being 28 buckets, each having a capacity of 7.63 cubic feet, struck measure. These buckets discharge at the rate of 15 per minute onto a grill which eliminates all the oversize material.

The material dropping through the grill goes through a wash box that feeds it into the screen. It is in this wash box that water is applied to the product, by means of 5 inch water jets. Water is furnished for this purpose by a high duty centrifugal pump, direct connected. This pump has a 12 inch suction and 8 inch discharge, thus furnishing ample water for washing purposes.

The screen, which is equipped with a jacket, is 17 feet long and 6 feet in diameter over all. This screen separates the sand and gravel and screens the sand in two ways. The rejected gravel is sent over the stern of the boat. The remainder passes into an auxiliary screen where it is separated into two grades or sizes. The gravel is chuted onto scows along one side of the dredge and the sand to the other side.

The buckets and elevator and also the screens are operated by the main engine, the second engine doing the winding, as previously explained. The dredge is also equipped with an electric light plant, which not only furnishes light for the living quarters but also for night operations. Thus if service of scows can be given to the dredge, operation can be carried on throughout the 24 hours of the day. This means a larger output and materially reduces the overhead cost.

Ample bunkers for coal are provided, as well as the necessary feed and service pumps, and also a feed water heater. This means economical coal consumption. If fresh water is difficult to obtain, the steam plant is made condensing, there being installed a service condenser, air and circulating pump, filter box and hot well.

Although the hull of the dredge illustrated is of wood, yet it can be constructed if necessary of steel, thus preventing teredo or other wood destroying worms from injuring the hull.

One of these dredges has lately repaid its owner its cost in eight months, showing in a striking manner the large output that is obtained, and the low cost of operation, and that the price is reasonable for this type and size of dredge.

Expectation Realized

Tonnage is Big Consideration in Eastern Markets

By Our Eastern Correspondent

The expectancy of heavy business with the advent of the spring season has come to pass in the sand, gravel and crushed stone markets in the eastern districts. Never, within recent months, has there been a more pronounced call for materials, and never, in this same time, have producers been more on edge with regard to immediate business. Deliveries are now being slated for several weeks ahead, as even capacity production will not insure the prompt dispatch of orders, and each must wait its turn.

Building material dealers show no hesitancy in stocking up; in fact, they are more anxious to secure tonnage than are the producers in supplying the demand, and simply because the trend of trade shows that the company with a reserve on hand in the immediate weeks to come is going to be in the best position to give all around satisfaction to customers in general.

Labor continues as a handicap to the situation. Sand and gravel pits are having difficulties in filling their working quotas, as prophesied in the last issue of PIT AND QUARRY, and the keen demand for common labor continues unabated. Wage scales have been advanced to meet the schedules established in other branches of trade and a fair degree of success has followed this action.

Plants in the Cow Bay section of Long Island, as well as in the different producing districts of New Jersey and Eastern Pennsylvania, are now practically all on the active list. The railroad situation is not of the best, and the call for cars brings but a percentage of the desired number. Those plants which are shipping by water are more fortunate, and better deliveries are being recorded by this means of transportation.

As to be expected in view of the demand for stocks, prices are holding strong at established levels, and will likely continue at present figures, if not at a fraction or so higher, well through the spring and summer periods. There is a growing call for crushed stone and cement for spring road construction, and millions of dollars of business are in sight in this branch of the industry, taking all cost factors into consideration. The state of New Jersey alone is arranging for a fund of $6,000,000 for permanent road-building during the coming fiscal year.

Crushed stone maintains at $1.65 and $1.75 per cubic yard in carload lots, f. o. b. New York, the first quotation being for 1½-inch stock, and the latter for ¾-inch material. These figures have prevailed for some few months past. Dealers are holding to a $4.00 level for both sizes, retail.

Selected gravel has moved to $2.25 a cubic yard, both 1½ and ¾-inch stocks, in cargo lots, wholesale, as compared with a previous quotation of $2.00. The new level is satisfying and good distribution is being recorded. A year ago at this time, the market was moving under a $1.75 rate. Dealers are still selling at $2.75, delivered on the job, but it is expected that this price will be advanced to $3.00 at an early date.

Good river sand continues at the $1.00 a cubic yard level for wholesale quantities, but there is a strong tendency for an advance. Producers cannot afford the present labor schedule, and hold to a figure which has been current for practically a year past. Dealers are selling the material at $2.00 and $2.25, the latter price having recently been established by a number of yards. Fine white sand is still being retailed at $4.50 a cubic yard.

As expected for several weeks past, following an advance in labor scales at the cement mills, an increase has come about in the wholesale cement market at New York. With a previous quotation of $2.60-$2.70 for truck deliveries, the present figures are $2.70-$2.80, with the latter prevailing. For cement alongside dock to dealers and contractors, $2.30 a barrel, less bags, still holds, but with every indication that this will be $2.40 very soon. Dealers have not as yet increased the retail rate, and this maintains at $3.20 delivered on the job, with current bag rebate of 10 cents.

Hydrated and lump lime show no change in the figures given in the last issue of PIT AND QUARRY. Spring construction work has ushered in a strong demand for both classes of material, and dealers are maintaining the best possible stock to handle the incoming call. Particularly heavy de-

liveries are going forward in the Brooklyn district, where extensive house construction is under way.

Granite quarries and plants at Concord and other producing districts in New Hampshire are developing maximum output to meet the current demand from all parts of the country. Practically every quarry is giving employment to a full working force, and the recent wage advance has gone to make for more general satisfaction among the men. It is expected that the present production schedule will be maintained for some months to come.

The Laurel Brick & Sand Co., operating at Laurel, on the Connecticut River, near Middletown, Conn., is planning for the opening of a granite quarry on its local properties and will be active in this line with a large working force during the spring and summer months. The company recently disposed of a portion of its land to the Benevue Co., lately organized, which will develop feldspar deposits, but has retained a tract of about 450 acres for its own use.

The Stonington Granite Co., Stonington, Me., has been organized under state laws with a capital of $100,000, to operate a granite quarry in this section. B. Lake Noyes is president; George B. Noyes, Jr., treasurer; and G. Howard Noyes, clerk and representative, all of Stonington.

Waldron Shield, Barre, Vt., a local granite operator, has recently been elected mayor of the city.

Fire, April 15, in the stone-crushing plant of Sweeney & Boland, Wolcott Road, Rochester, N. Y., contractors, caused a loss estimated at $12,000. It is planned to rebuild at once. The plant has been arranging for an active season and the company is said to have considerable work on hand.

The East Flatbush Stone Corporation, Brooklyn, N. Y., has been formed under state laws with a capital of $5,000, to operate a crushed stone business. The new company is headed by A. J. Clayton and De V. Chilton. It is represented by F. S. Chilton, 44 Court street, Brooklyn.

The George W. Maltby & Sons Co., Buffalo, stone contractors, operating a works at 21 Maryland street, will commence the immediate erection of a new one-story addition at the plant for general production service, estimated to cost about $6,000.

James Kerney, Trenton, N. J., and Joseph Quigg, Newark, N. J., Federal receivers for the Eastern Potash Co., New York, with plant at Raritan Township, near New Brunswick, N. J., are perfecting plans for a reorganization of the company, and propose to pay the creditors in full. The plan covers the formation of a new company to take over the present assets, and giving stock for existing debts. It is also purposed to place the plant in operation as soon as possible, and establish the project on a going basis. According to a late appraisal, the present assets of the company aggregate $1,012,544, and as a going business, the valuation is placed at $1,382,328.

The De Frain Sand Co., Philadelphia, Pa., will commence the immediate erection of a new building at its sand and gravel distributing plant at Twenty-eighth and Christian streets, estimated to cost about $22,000.

Slate quarries at Slatington, Pa., are running full and a large volume of orders has been received for spring and summer deliveries. A number of the plants are feeling the labor shortage and an effort is being made to secure more men. Wages have recently been advanced. About 30 men at the plant of the Parsons Brothers Slate Co., Pen Argyl, recently declared a strike, following a dispute regarding wages. The company arranged for an advance, but the amount was not satisfactory to the men. The works are running on a curtailed basis until an agreement can be effected.

The Benvenu Coal Co., Marysville, Pa., recently organized with a capital of $20,000, has plans in progress for the operation of a dredge for the production of sand and gravel, as well as river coal. It is expected to develop a large output as the season advances. The company is headed by Chester S. Sheaffer, Harry J. Deckard, and William J. Donovan, all of Marysville.

The National Cement company, which is headed by Isaie LaPlante of Fall River, Mass., is planning to erect a cement mill in Montreal East, Quebec, Canada, which will have a capacity of 3,000 barrels daily. Mr. Isaie LaPlante of Fall River is president; Manuel Sylvia, New Bedford, vice-president; Edmond Cote, Fall River, treasurer and general manager. It is expected that ground will be broken about May 1st, 1923, and the mill will be in operation Jan. 1st, 1924.

Sloan in City Office

Granite Man to Head Chicago Board of Local Improvements

John J. Sloan of Chicago, secretary of the Wisconsin Granite Company and a well-known producer and association member, has been selected by Mayor Dever for the presidency of the board of local improvements in the new administration. And Mr. Sloan has accepted, on the understanding that he will be given an aggressive board whose sole policy will be to benefit the city.

This is considered by Mayor Dever and his advisers to be the most important by far of all of the cabinet positions remaining to be filled. The mayor is anxious to do something for the city and one opportunity lies, in his opinion, in the board of local improvements.

John J. Sloan of the Wisconsin Granite Co.

His ability, training and experience fit him for the job of directing the work of local improvements. He is a product of the Armour institute. He was chief clerk of the department of public works years ago when it handled the special assessment work. Later he was superintendent of the bridewell and made a remarkable success of it. He has been trained in special assessments, engineering, paving materials, and in construction.

It is reported that Mr. Sloan has not promised to remain in the city service during the mayor's entire term, but has consented to stay only a limited period.

Safety Association Gains Ground

Forty-six chapters of the Joseph A. Holmes Safety Association have been formed in 16 states, as follows: Pennsylvania 9, Indiana 6, Virginia 4, Michgan 3, New York 1, Tennessee 2, Colorado 1, North Dakota 5, Florida 2, Illinois 6, Montana 2, Alabama 1, California 1, Missouri 1, Washington 1 and West Virginia 1. Phases of the mining industry represented include bituminous and lignite coal mines, copper mining, gold mining, lead mining, salt mining, phosphate mining, and petroleum refining. Individual membership of chapters is approximately 1,600 full members and 70 junior members. Some of the chapters have women members.

Chapters have been formed in the majority of cases in connection with the first aid and mine rescue training activities of the Bureau of Mines of the Department of the Interior. Mining companies have cooperated in numerous instances with chapters in the furnishing of charter fee and first aid suppies. Several safety societies with a record of safety accomplishments extending over a period of years have affiliated with the Joseph A. Holmes Safety Association.

Activities of the various chapters have thus far consisted of first aid training and retraining to chapter members; participation of chapters in state and local first aid contests; rescue apparatus work at mine fires and explosions; first aid treatment of accident cases by various chapter members; motion picture displays of a safety or educational nature staged by various chapters; public meetings of chapters featuring lectures and addresses by available speakers; smokers; suppers; entertainments; establishment of chapter club rooms in several instances; and a "safety week" campaign put on by an Indiana chapter.

The River Sand and Gravel Co., 5th and Market Sts., Camden, N. J., has been incorporated with a capital of $125,000.

Cement at High Mark

First Quarter of 1923 Doubles Five-Year Average

Production of portland cement during March was unusually heavy for this season of the year, according to a bulletin of the Portland Cement Association. Mills of the country produced nearly 9,900,000 barrels, almost 2,000,000 barrels more than in February and nearly 50 per cent more than in March, 1922. Production for the quarter ending March 31 was considerably more than 35,000,000 barrels as compared with an average of slightly over 17,000,000 for that quarter during the five year period, 1919-1923.

Shipments from the mills during March, 10,300,000 barrels, established a high mark for that month and were more than 47 per cent greater than in March, 1922. For the first quarter of the year shipments were 21,500,000 barrels, a quantity greatly in excess of the amount moved in any similar period and approximately 54 per cent higher than the average for the five year period, 1919-1923.

Stocks of finished cement in manufacturer's hands decreased about 450,000 barrels for the month or less than 4 per cent.

It is impossible to state how much of the amount shipped during the first three months has actually been used. From the unusual amount of winter construction which has been carried on, it is safe to assume, however, that the quantity used is greater than in any similar period. It is also a fact that greater quantities than heretofore have been stored up by the highway departments of a number of states, contractors and others in order to avoid transportation difficulties which are expected to increase when the active construction season opens.

In a recent report, Secretary of Commerce Hoover has recommended to President Harding that the different divisions of the Government be directed to initiate no new work that is not eminently necessary to carry on the immediate functions of the Government. One of the reasons assigned is that "Transportation facilities, available for the building materials are fully loaded and almost constant car shortages are complained of with consequent interruption in production"; also that "lobar in the construction trades and in the manufacture of materials is not only at full employment, but there is actually a shortage in many directions." Such action on the part of the Government would tend to relieve the transportation and labor situation somewhat, but it cannot be foretold to just what extent.

The situation so aptly described by Secretary Hoover is particularly true of the cement industry. The problem is not one of capacity to produce, but rather of the transportation of enormous quantities of raw materials and fuel supplies and distribution of the finished product. In some sections the question of an adequate supply of labor is also an important factor. In the industry's largest year—1922—the amount of cement which could be moved resulted in operation of only about 80 per cent of capacity. This year it is anticipated that capacity will be considerably expanded by the completion of several new mills and additions to existing plants.

Mr. John Karscher, of Celina, Ohio, has recently bought the Troy Huey Quarry at Portland, Ind. Mr. Karscher is planning to install machinery and equipment to cost in the neighborhood of $100,000.

The Bucyrus Company, South Milwaukee, Wis., announces the removal of its Chicago office on May 1st from 622 McCormick Building to new quarters, Room 1015, Corn Exchange Bank Building, 134 South La Salle Street.

The El Cerritto Quarry Co., Oakland, Cal., has been incorporated with a capital of $25,000. Attorney, E. E. Keves, Federal Realty Bldg., Oakland.

The Sound Sand and Gravel Co., Seattle, Wash., has been incorporated with a capital of $50,000. W. R. Chesley, A. S. Kerry and J. W. Kerry.

The Bogeda Materials Co. has been incorporated at Aldridge, Ill., with a capital of $200,000 to own, lease and operate stone, sand, gravel, quarry, tile, cement and kindred products. The incorporators are James C. Emory, Oskaloosa, Iowa, Thomas Aldridge, Wolf Lake, Ill., and R. E. Renfro, Carbondale, Ill. The principal office of the incorporation will be located in Murphysboro, Ill.

Production at Peak

Cement Mills Off on High for a Record-Breaking Year

Peak production prevails in the cement mills in the Lehigh Valley district of Pennsylvania. There is an unprecedented demand for material for all branches of the construction trades, with road-building coming well to the front in line of call for immediate deliveries, and practically every mill is doing its best to supply the requirements. It is said that throughout the spring and summer months there will be no curtailment in operations, only such as may be necessitated in the line of equipment repairs. The prospects are for a record-breaking year.

The spring call for freight transportation in all lines of trade, has resulted in fewer cars for cement shipments in this section. The noticeable scarcity is in box cars, and the railroads are falling far short of the necessary tonnage quota for daily dispatch. Up to a few weeks ago there was a noticeable improvement in the freight situation, and it is expected that as the weeks go by a more normal condition will ensue. In the meantime, other means of conveyance are being pressed into service, with motor trucks doing fine duty in connection with reasonably nearby hauls. Philadelphia is securing a large amount of material in this way.

The labor situation is relatively fair, despite the fact that there is a marked shortage of common labor. Mills are doing their best to fill up the present gaps in the working force, and recent wage advances have been made to correspond to those granted by the iron and steel interests in order that the men will not quit their jobs and seek employment in one of the nearby plants of this character, and which has occurred in previous years. Skilled labor in certain branches of cement mill service is equally hard to secure, and current indications point to a still greater shortage in the months to come.

The fuel question is righting itself in substantial fashion, and local mills are in first class condition in this respect, with each day showing the trend for improvement. Coal is fairly abundant and a number of the plants are

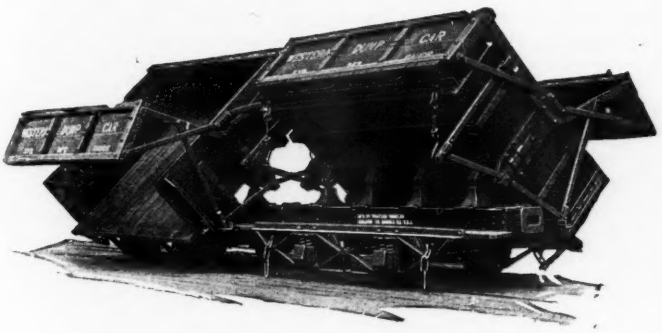
The Lehigh Portland Cement Co., Allentown, Pa., is running full at its different mills in this district. The New Castle plant is developing a heavy taking the opportunity to lay in a reasonable reserve.
output and employment is now being given to about 800 men at this works. The company has granted a wage advance of 10 per cent, effective April 1, at all mills. An increased scale has also been operative in office and other such departments, the exact amount of such advance not being made public. The Ormrod and West Coplay plants are very busy and a large tonnage is moving from these points. Additions are being made in the working forces at a number of the mills.

All plants at Coplay, Pa., are on a capacity basis, and there is a call out for more men at a few of the plants. The Coplay Cement Co., is running at both of its mills, known as Plants B. and C., and with equipment repairs recently completed, it is expected that continuous production will continue for an indefinite period. The company has adopted an increased wage scale for common labor and other departments, following the advance made by the other prominent mills in this section.

The Atlas Portland Cement Co. continues under heavy output at its large plant at Northampton, Pa., as well as at the smaller mills at Coplay and other points. The company was among those to lead in adopting a 10 per cent wage advance for all employes in the producing and operating departments early in April, and the new scale is now in force. Recent additions have been made in the working quota, and it is said that the company still has a call out for more men, despite the fact that over 6,000 operatives are now on the payroll. The Northampton mill is now on a full production basis, as are the other plants of the company in this district.

The Alpha Portland Cement Co., Easton, Pa., is one of the heaviest producers in the Lehigh Valley region at the present time, and has advanced the output at a number of its mills. There is a heavy call for material from New York and the Northern New Jersey districts, in which territories the Alpha company has large distribution. A wage advance of 10 per cent has been made effective at the plants, and extensive additions have been made in the working forces in a number of de-

Speaking of Dump Cars



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partments during the past six weeks. Progress is being made in the line of extensions and improvements at the Martin's Creek mill, referred to in the last issue of PIT AND QUARRY, and this work will be pushed to completion. F. M. Coogan, a vice-president of the company, suffered a painful fracture of the shoulder when he fell from a horse he was riding at the Northampton Country Club a few weeks ago, being confined to his home at Phillipsburg, N. J., for a number of days.

Other active companies in the Lehigh Valley district at the present time are the Bath Portland Cement Co., with mill at Bath; the Nazareth Cement Co., at Nazareth; the Hercules Cement Co., also operating at Nazareth; the Giant Portland Cement Co., at Egypt; and the Whitehall Cement Mfg. Co., with mills at Cementon. Practically all these plants have adopted a 10 per cent wage increase for operatives, and seeding out large tonnages each day. So far as possible under present conditions, full working forces are being employed.

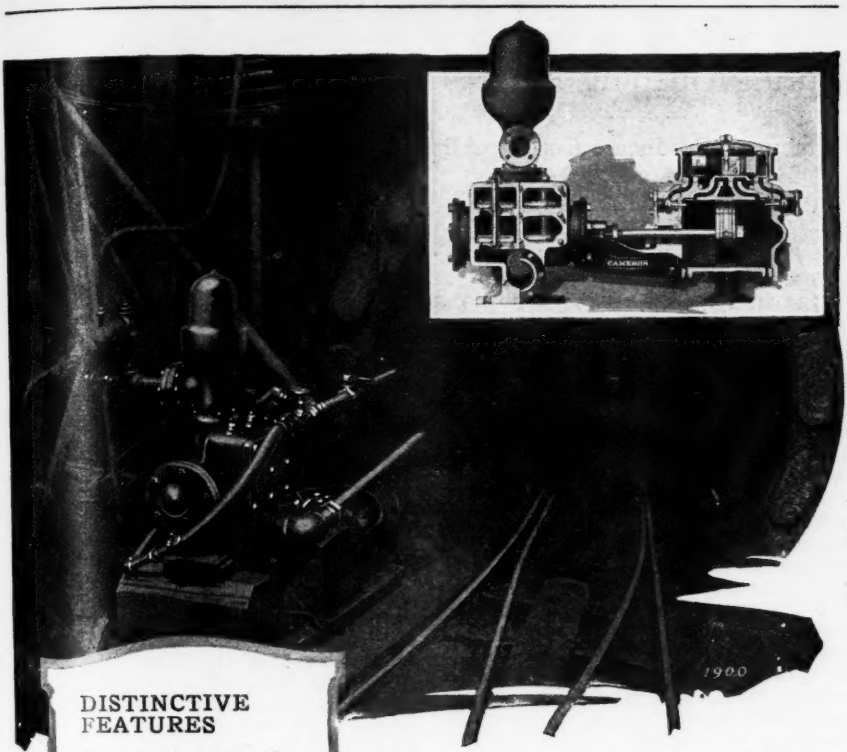
There is no change in the mill base among the plants in the Lehigh Valley territory, the rate of $2.10 in carload lots, without bags, being quite well established. At the same time, an advance of 10 cents in this level as the season matures would not occasion any great surprise, as the increase in operating costs is now all the more pronounced. Other districts maintaining this same base are Mitchell, Ind., where an increase recently was made to such point, Iola, Kan., Hannibal, Mo., and Mason City, Ia., the latter place having increased from $2.05 during the last month. Buffington, Ind., and Steelton, Minn., are running on a $1.95 barrel base, while $2.00 is current at the mill of the Universal Portland Cement Co., at Universal, Pa. Hudson, N. Y., is among the places asking $2.20 at the mill, and which rate is also being used at Leeds, Ala., Alpena, Mich., and Fordwick, Va.

There is pronounced activity in the line of expansion in the different cement plants in Texas. The Southwestern Portland Cement Co., El Paso, is running full at its local mill, with a large working force, and has acquired a tract of land on Sycamore Creek, near Fort Worth, for possible use for a new plant. Tentative plants are now under consideration for the new mill, which will be designed for an initial output of approximately 3,000 barrels per day. The plant will consist of a number of buildings, including power house, machine shop and other operating structures, and is estimated to cost close to $500,000. The Texas Portland Cement Co., Dallas, has work under way on enlargements at its mill near Manchester, Tex., to include the installation of additional machinery in a number of departments as well as repairs to present equipment, to increase the annual capacity to a rating of 800,000 barrels.

The Southern Portland Cement Co., Macon, Ga., recently organized under Delaware laws with a capital of $6,000,000, has taken title to property at Ainslie, Ga., about 29 miles from Macon, comprising a large acreage with extensive cement rock deposits. Plans are nearing completion for the erection of the initial plant unit and it is expected to break ground at an early date. The complete works will consist of a number of mills, with power house and other mechanical structures, and is estimated to cost in excess of $1,500,000. It is said that about 4,000,000 barrels of cement are consumed annually in this territory, and the company proposes to secure the bulk of this trade. The new organization is headed by W. Jordan Masse, president of the Bibb Brick Co., Macon, who will act as president of the Southern company and give personal attention to the enterprise. George P. Diekmann, chemical engineer, has been elected vice-president and general manager. E. E. Satterfield, Macon, a well known capitalist, will act as secretary and treasurer.

The Riverside Portland Cement Co., Riverside, Cal., is operating at full capacity at its local mills, giving employment to a large working force. There is a heavy call for production from Los Angeles and other sections of Southern California, and every effort is being made to supply the demand. The company is said to have plans in prospect for the establishment of a new mill on site to be selected in Arizona, and has been in communication with the Chamber of Commerce at Phoenix, for possible location here.

The Petoskey Cement plant, Petoskey, Mich., which has been closed down for repairs, is now in full operation. The company's officials predict that the year's output will reach 700,000 barrels.



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A. S. CAMERON STEAM PUMP WORKS

Spring Opening Pleases

Pittsburgh Producers Getting All Equipment into Action

There is growing activity in the sand and gravel industry at Pittsburgh, Pa. and vicinity, and producers are enlisting all available equipment to keep pace with the call. The dredgers are busy on the rivers and large tows are being hauled to the Pittsburgh landings, as well as other points occupied by the steel companies and allied interests. The spring season has opened up in a highly satisfactory manner and there is no let-up in sight.

Washed gravel maintains at $2.00 a cubic yard delivered on the water front, while taken f. o. b. float, the prevailing level stands at $1.60 and $1.65. Dealers are asking $2.75 and $3.00 for the material, delivered on the job, with quotations based on the length of haul. Best grade river sand is operating under a good demand, with prices holding from $1.00 upwards per cubic yard, dependent upon the character of delivery; on the dock, a $1.25 level is current. Crushed stone stands at $2.85 a cubic yard in wholesale quantities, for 1½ and ¾-inch sizes. Portland cement is selling at $2.24 a barrel in cargo lots, f. o. b. city to dealers and contractors, without bags, while supply yards are asking $3.50 a barrel, including bags, for which an allowance of 10 cents each is in force.

J. K. Davidson & Brother, Pittsburgh, are developing a heavy capacity and their fleet is busy daily on the river. The company dredgers are in service on a full production basis, including the "J. K. Davidson." The towboat "Bronx" is making the different landings with well-loaded scows, and the material is finding a ready market. Activities will be continued on the present basis for an indefinite period.

The Rock Point Sand Co., Pittsburgh, with plant at Wampum, is disposing of large quantities of river sand and gravel, and is keeping its dredgers on the active list. It is said that orders on hand insure capacity for some months to come, particularly in the line of specialty sands for core work and other service.

The Iron City Sand Co. and the Rodgers Sand Co., are other active producers at the present time, and the immediate call for stocks is said to be well over the normal for this season of the year. The first noted company is continuing its dredging on the Allegheny River, using the "Monarch" dredger for this service.

The East Liverpool Sand Co., East Liverpool, Ohio, is in the Pittsburgh district. A ladder-bucket type of digger is being used on the Ohio River for sand and gravel production, and large quantities of best grade material are being produced. The company also operates its own towboat, and has a fleet of fifteen barges available for the river service. A stiff-leg derrick hoist is also being used effectively for the transferring of stock from barges to motor trucks for local deliveries. A full working force is being employed.

C. B. Gould, formerly sales engineer for the Barber-Greene Co., Aurora, Ill., has recently been given charge of the Barber-Greene office at Detroit, with the title of district manager. Mr. Gould is a graduate of the University of Illinois and has had considerable conveyor experience, having been with the engineering and erection department of Stephens-Adamson Company at Aurora, before becoming affiliated with the Barber-Greene Co. During the war, Mr. Gould served as a lieutenant in the air service.

Owing to the increase of their business, the Chicago office and warehouse of the Victor Balata & Textile Belting Co. have been forced to move from their present location at 167 N. Market street. On and after May 1st, this company will be located at 345-359 W. Austin avenue, Chicago, which location will give them very improved shipping facilities, enlarged and increased space, as well as many other additional advantages.

The Daigler Sand & Gravel Co., Williamsville, N. Y., has increased its capital from $100,000 to $150,000.

The Burress Gravel Company, of Shoals, Ind., is installing a washing plant at their operation in order to furnish clean gravel to their customers.

The United Sand and Gravel Company, Ft. Wayne, Ind., has been incorporated with a capital of $25,000. Directors: F. Eubelhoer, F. M. Hogan and K. J. Stone.